Vol. 1045 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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August 21 1984

U.S.
DEPARTMENT
OF COMMERCE

Patent
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 21, 1984 Volume 1045 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,979,548, Re. S.N. 600,562, Filed Apr. 17, 1984, Cl. 428/281, POLYURETHANE COATED SAFETY GLASS, Wolfgang Schafer, et al., Owner of Record: *Saint-Gobain Industries, Neuilly-sur-Seine, France,* Attorney or Agent: John T. Synneslvedt, et al., Ex. Gp.: 154

4,272,792, Re. S.N. 580,867, Filed Feb. 16, 1984, Cl. 360/69, MODE CHANGING SYSTEM FOR A CASSETTE TAPE RECORDER, Niro Nakamichi, et al., Owner of Record: *Nakamichi Corp., Tokyo, Japan,* Attorney or Agent: Charles B. Gordon, et al., Ex. Gp.: 235

4,306,791, Re. S.N. 438,003, Filed Mar. 28, 1983, Cl. 354/126, SINGLE LENS REFLEX CAMERA, Akihiko Hashimoto, et al., Owner of Record: *Olympus Optical Co. Ltd., Tokyo, Japan,* Attorney or Agent: Ezra Sutton, Ex. Gp.: 211

4,330,017, Re. S.N. 607,584, Filed May 7, 1984, Cl. 138/126, RUBBER HOSE FOR AUTOMOTIVE FUEL LINE, Seikoh Satoh, et al., Owner of Record: *Nissan Motor Co., Ltd., Yokohama City, Japan and Togawa Rubber Manufacturing Co., Ltd., Osaka, Japan,* Attorney or Agent: Arthur Schwarts, et al., Ex. Gp.: 243

4,330,063, Re. S.N. 608,032, Filed May 7, 1984, Cl. 209/608, MACHINE-RETRIEVABLE CARD AND CARD RETRIEVAL APPARATUS AND METHOD THEREFOR, Paul Neumeier, Owner of Record: *O. K. Partnership, Cincinnati, Ohio,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 312

4,371,723, Re. S.N. 471,320, Filed Mar. 2, 1983, Cl. 568/861, PROCESS OF PRODUCING A DISTILLED BUTANEDIOL PRODUCT OF HIGH QUALITY IN HIGH YIELD, Max E. Chidix, Owner of Record: *GAF Corp., New York, N.Y.,* Attorney or Agent: Marilyn J. Maue, Ex. Gp.: 126

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,021,891, Reexam. No. 90/000,596, Requested: July 20, 1984, Cl. 524/303, MAGNETIC LOCK CLOSURE, Tamao Morita, Owner of Record: *Application Art Laboratories Co., Ltd., Tokyo, Japan,* Attorney or Agent: Wenderoth, Ling & Ponack, Ex. Gp.: 155, Requester: Sama S.P.A., Milan, Italy

4,072,252, Reexam. No. 90/000,590, Requested: July 12, 1984, Cl. 222/341, HAND OPERATED SPRAYER WITH AUTOMATIC CONTAINER VENT, Emile B. Steyns, et al., Owner of Record: *AFA Corp., Miami Lakes, Fla.,* Attorney or Agent: Thomas R. Vigil, Ex. Gp.: 311, Requester: Lawrence R. Radanovic, Washington, D.C.

4,270,606, Reexam. No. 90/000,593, Requested: July 12, 1984, Cl. 166/181, APPARATUS FOR SELECTIVE DISENGAGEMENT OF A FLUID TRANSMISSION CONDUIT AND FOR CONTROL OF FLUID TRANSMISSION FROM A WALL ZONE, David McStravick, et al., Owner of Record: *Baker International Corp., Orange, Calif.,* Attorney or Agent: William C. Norvell, Ex. Gp.: 350, Requester: Owner

4,382,750, Reexam. No. 90/000,595, Requested: July 13, 1984, Cl. 417/404, HIGH PRESSURE FLUID PUMP, Walter Robertson, et al., Owner of Record: *Hydro-Pac, Inc., Fairview, Pa.,* Attorney or Agent: Ralph Hammar, Ex. Gp.: 340, Requester: John C. Hilton, Hartford, Conn.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 2

Docket No. 40785 - 4085

TRADEMARK AUTOMATED SEARCH SYSTEM FEES

AGENCY: Patent And Trademark Office, Commerce

ACTION: Notice of proposed rulemaking

SUMMARY: The Patent and Trademark Office proposes to amend the rules of practice in part 2 of Title 37, Code of Federal Regulations, to set forth charges that will be made to users of a new automated trademark search system. Public Law 96-517, enacted on December 12, 1980 and Public Law 97-247, enacted on August 27, 1982, authorized the Commissioner to establish fees for all services related to trademarks. In compliance with Section 9 of Public Law 96-517, the Patent and Trademark Office prepared and submitted to the Congress on December 12, 1982, an automation master plan. The first stage of this plan called for the automation of trademark operations. The proposed rule changes are intended to establish a basis for the charges for use of the automated systems. Comments on the proposed changes are solicited.

DATES: Comments must be submitted on or before September 5, 1984. A public hearing will be held on September 5, 1984, at 9:30 a.m. Requests to present oral testimony should be received on or before August 28, 1984.

ADDRESSES: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: J. Howard Bryant, Administrator for Automation, Room CP6-1108. The hearing will be held in Room 11C10 on the 11th floor of Building 3, Crystal Plaza, located at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: J. Howard Bryant by telephone at (703) 557-6000 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The proposed rule change is designed to establish new fees for the use of an automated trademark search system and the methods of fee collection.

BACKGROUND: As part of the PTO plan to automate trademark operations, three interrelated systems have been developed:

TRAM (Trademark Reporting and Monitoring) stores and maintains a complete file of trademark application and registration information including status and location data. The data base maintained by TRAM will become the official trademark register, ultimately replacing bound paper volumes that have previously served this purpose.

T-SEARCH (Trademark Search) maintains a data base of basic trademark application and registration information, consisting of textual data, digital facsimiles of figurative marks, and certain indexes to aid in searching the data base. T-SEARCH will provide a variety of automated capabilities for searching the data base and retrieving the textual and figurative information.

T-CAR (Trademark Computer Assisted Retrieval) uses microfilm cassettes and provides automated serial or registration number indexes to enable retrieval and printing of images of trademark case papers or documents.

In developing the data to be used with these systems, the PTO executed agreements with three private firms that will have created computer processable data bases - text, digitized facsimiles, and design codes (indexes) - at their own expense in exchange for rights to use certain of the data for their own purposes. The original agreement provided that their contributed data could not be used by the public with the T-SEARCH system except in a manner comparable and equivalent to the manner in which the current paper files are used. These agreements have now been renegotiated to allow the public to use all the capabilities of T-SEARCH. To gain this access for the public, the PTO agreed to collect and pay a royalty to these firms as repayment for their investment in the data bases. Thes arrangements are described below.

LEVELS OF T-SEARCH CAPABILITY: The PTO will provide the public with access to two levels of capability using T-SEARCH:

The FULL SYSTEM capability will allow unrestricted access to all T-SEARCH data and will permit use of phonetic search programs, Boolean logic operators, and all design descriptor codes. The FULL SYSTEM capabilities are those used by PTO trademark examiners.

The BASIC SYSTEM or more limited level will provide capabilities "comparable and equivalent" to present manual, paper file searching in the PTO Search Library. A subset of the design descriptor codes, considered to be better than the current design file in level of detail, will also be provided.

For the use of the FULL SYSTEM capabilities, the PTO will collect a royalty of $30.00 per hour of terminal session time, prorated for actual time used, to be distributed among the private firms on the basis of a formula that has been mutually agreed upon by all the parties. The royalty was based on the estimated value of the investment by these firms in the creation of the data, compounded at a rate of ten percent annually to take into account the time value of money. When the full value of the data provided by these firms has been paid, no further royalty will be paid. While the payout period was projected over a 10-year period, the payout could occur at any time that the principal investment cost has been paid.

User charges for the BASIC SYSTEM were calculated on the marginal cost of providing the public services. Marginal costs included additional equipment, space, personnel, and similar costs attributable to the public search services, but did not include the cost of T-SEARCH development which was required for use by PTO examiners. The estimated cost of the BASIC SYSTEM was determined to be $40.00 per hour of terminal session time, prorated for actual time used.

The proposed charge for the public users of the FULL SYSTEM will be the cost of the BASIC SYSTEM plus the cost of the royalty payment, for a total of $70.00 per hour of terminal session time, prorated for actual time used. All payments for use of either level of T-SEARCH capabilities will be made in advance through deposit accounts or daily prepayments to cover the anticipated costs. Imbalances between daily prepayments and actual accrued costs will be refunded to the user.. T-SEARCH results, consisting of inquiries submitted for the search, application and registration data, and figurative marks, may be viewed in an electronic display and printed. In addition to the charge for the use of T-SEARCH terminals, there will be a charge of twenty cents for each page requested to be printed.

T-SEARCH FEES: Public users of T-SEARCH will have four options for paying for search services and related printing:

1. Deposit Accounts

The standard PTO deposit account system (see 37 CFR 1.25) may be used. A one-time authorization to charge the deposit account for T-SEARCH fees will be necessary.

2. Cash Deposits

Upon submission of cash, the amount will be credited to a working account in the T-SEARCH system. Ten minutes prior to the depletion of the cash deposit during the search process, the user will be given a warning signal or message. If the funds are depleted before the session is voluntarily terminated by the user, the terminal display will be automatically turned-off. The system will complete the transactions in process, including the last search inquiry, and then automatically terminate the session. The user can pay the additional amount due (terminal session time used to complete the search in process plus the cost of pages printed), to receive the printed results of the search. If the cash deposit is not depleted before the session is terminated by the user, the cash balance will be refunded.

3. Deposits By Check of a Specific Amount

The same procedure discussed under item 2. above may be used by depositing a specific amount by check. On completion of the session, the user may substitute a new check for the amount actually due to replace the original deposit check. Alternatively, if a refund is due, the refund check will be mailed.

4. Unspecified Amount Check Deposit

The user may submit a signed check with the amount left blank, to be filled-in at the completion of the session.

For options 2. and 3. above, a minimum of $40 must be deposited.

Some terminals will be available for reservation for specific blocks of time. Reservations must be paid for in full in advance. The process will be the same as the process for cash or checks for specific amount except that the cost of the full block of time will be charged regardless of the actual time used.

The TRAM and T-CAR systems will continue to be available to the public at no cost, other than the cost of twenty cents for each printed or copied page that is requested or made by the user.

When the automated systems have been fully proven, the PTO intends to discontinue maintenance and ultimately to dispose of the paper search file. However, a public hearing will be held before a final decision is reached about the dispostion

of the paper file.

DISCUSSION OF IMPACT

The proposed rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change would not have an adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, P.L. 96-374), since it makes an on-line, fully automated system available to the public at lower rates than can be obtained commercially - $40 an hour for the comparable and equivalent capabilities, and $70 an hour for the full system capabilities. The most comparable commercial systems cost $85 or more for each hour of use.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change does not contain a collection of information requirement for the purpose of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

List of Subjects in 37 CFR Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 15 U.S.C. 1113 and 1123, Pub. L. 96-517 and Pub. L. 97-247, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below.

Part 2 - (Amended)

It is proposed to amend 37 CFR Part 2 as follows with additions indicated by arrows.

1. Section 2.6 is proposed to be amended by adding new paragraphs (u) and (v) to read as follows:

§ 2.6 Trademark fees

* * * * * *

▶ (u) Marginal cost, paid in advance, for each hour of terminal session time using the BASIC T-SEARCH SYSTEM capabilities, prorated for the actual time used

$40.00

(v) Royalty paid in advance, for use of data provided to the PTO by private firms, for each hour of terminal session time on the FULL T-SEARCH SYSTEM, prorated for the actual time used (additional to the BASIC T-SEARCH SYSTEM capabilities in (u) above)

$30.00 ◀

Gerald J. Mossinghoff
Commissioner of Patents
and Trademarks

Dated: JUL 17 1984

PATENT NOTICES

Certificates of Correction for the Week of Aug. 21, 1984

3,997,241	4,404,141	4,429,320	4,438,798
4,252,188	4,404,454	4,430,298	4,439,292
4,290,788	4,405,018	4,430,942	4,439,345
4,301,268	4,409,791	4,431,436	4,439,798
4,302,465	4,410,247	4,432,499	4,439,812
4,324,769	4,410,397	4,432,522	4,439,821
4,344,956	4,410,527	4,432,703	4,439,872
4,351,839	4,411,555	4,433,393	4,441,886
4,354,080	4,411,853	4,433,588	4,442,426
4,359,016	4,414,407	4,434,561	4,442,440
4,363,814	4,415,459	4,434,644	4,442,553
4,369,832	4,415,771	4,436,837	4,442,669
4,371,018	4,415,988	4,436,847	4,444,509
4,376,765	4,416,359	4,436,871	4,445,365
4,383,602	4,416,999	4,437,439	4,446,183
4,386,790	4,417,264	4,437,489	4,446,196
4,388,777	4,418,297	4,437,601	4,447,255
4,391,693	4,421,822	4,437,755	4,447,274
4,394,697	4,422,025	4,437,834	4,447,373
4,400,271	4,423,224	4,437,995	4,447,547
4,401,582	4,423,707	4,438,227	4,448,958
4,402,597	4,424,884	4,438,405	4,450,145
4,404,092	4,427,334	4,438,691	

Disclaimers

4,191,705.—*Christian Lindner,* Cologne; *Carlhans Suling; Herbert Bartl,* both of Odenthal; *Manfred Schreckenberg,* Krefeld; *Dieter Freitag,* Krefeld-Traar; and *Klaus Konig,* Leverkusen, Germany. PROCESS FOR THE PREPARATION OF CARBONIC ACID ESTERS OF POLYESTER-POLYOLS. Patent dated Mar. 4, 1980. Disclaimer filed June 6, 1984, by the assignee, *Bayer Aktiengesellschaft.*

Hereby enters this disclaimer to claim 15 of said patent.

4,278,453.—*Jordan N. Klein,* Summerfield, Fla. GAS PURIFICATION. Patent dated July 14, 1981. Disclaimer filed June 7, 1984, by the assignee, *Mako Compressors, Inc.*

Hereby enters this disclaimer to claims 5–10 of said patent.

4,291,597.—*Herbert Allen,* Houston, Tex. CORK EXTRACTOR. Patent dated Sept. 29, 1981. Disclaimer filed May 2, 1984, by the assignee, *Hallen Co.*

The term of this patent subsequent to July 7, 1998 has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 7, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-21-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-24-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-30-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-25-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	10-01-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-29-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-29-81
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	3-29-82
DESIGN, GROUP 290—K. L. CAGE, Director	4-02-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	9-14-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-29-81

Expiration of patents: The patents within the range of numbers indicated below expire during July 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,328,806 to 3,333,279, inclusive

Plant Patents ..... Numbers 2,750 to 2,755 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,648
SYSTEM FOR GENERATING TONE SOURCE WAVESHAPES

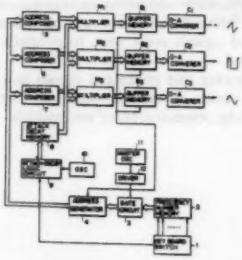
Michio Kondo; Akira Nakada; Masanobu Chibana; Tsuyoshi Futamase, and Akiyoshi Ohya, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Original No. 4,119,005, dated Oct. 10, 1978, Ser. No. 784,317, Apr. 4, 1977. Continuation of Ser. No. 116,583, Jan. 29, 1980, abandoned, which is a continuation of Ser. No. 619,557, Oct. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 448,573, Mar. 6, 1974, abandoned. Application for reissue Dec. 7, 1981, Ser. No. 328,261

Claims priority, application Japan, Mar. 10, 1973, 48/28159

Int. Cl.³ G10H *1/02, 5/10*

U.S. Cl. 84—1.01 **17 Claims**



13. An electronic musical instrument comprising:

means for producing a set of digital addresses which progress through a fixed range of values in a certain time interval corresponding to the period of a selected musical note, and

digital logic circuitry means for forming waveform sample point amplitude values, without the use of a waveform memory, by manipulation of the digital address values themselves, said manipulation being carried out in unison with the progressive changes in digital address value so that the resultantly formed musical waveform has the period of said selected note.

Re. 31,649
COMBINED TELEPHONE INDEX AND KEYBOARD FOR DIALER

Robert M. Brodbeck, Littleton, Colo., assignor to Marcamor, Inc., Denver, Colo.

Original No. 4,164,630, dated Aug. 14, 1979, Ser. No. 851,149, Nov. 14, 1977. Application for reissue Aug. 12, 1981, Ser. No. 292,175

Int. Cl.³ H04M *1/274*

U.S. Cl. 179—90 B **7 Claims**

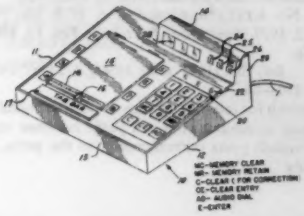
1. Telephone index and combined switch arrangement for memory stored dialing data for automatic dialing telephones comprising:

(a) a housing having an entry keyboard switch means thereon for entering numbers to be stored and display means for displaying the number entered by said entry keyboard [,];

(b) multiple card index means for a visual listing of names and telephone numbers, each card including individual lines for individual numbers arranged in the same position on the cards, wherein said card and lines are divided into a plurality of left-hand lines and a plurality of right-hand lines, said left-hand and right-hand lines being substantially equal in number, and further including a cover positioned over said cards and finding means on said cover for positioning an individual card for visual display of the card's content;

(c) card switch means including an individual [contract] *contact* associated with each card index and activated by positioning said finding means to display the particular card to thereby close said card switch means completing a circuit for said card including a common lead and a common bus bar associated with said finding means and an individual lead for each card, said card switch means being initially energized when said cover is closed;

(d) selector switch means including a left-hand and a right-hand series of push buttons with one button in said left-hand series for and adjacent to each of said left-hand lines and one button in said right-hand series for and adjacent to each of said right-hand lines so that said selector switch means is activated by a push button to close a circuit for a particular line positioned on an individual card to thereby complete a first circuit associated with the card contained data and close a second circuit associated with a particular line on a card to retrieve and automatically dial a telephone number stored at a location in the memory associated with said particular line; and



(e) a visual display panel means on said housing adjacent said cover for displaying the number dialed by actuating said card switch and selector switch.

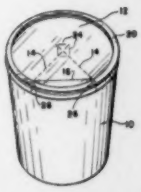
Re. 31,650
NON-SPILLABLE CUP LID

James J. Serritella, 2105 Lewis Ave., Rockville, Md. 20851

Original No. 3,800,999, dated Apr. 2, 1974, Ser. No. 165,611, Jul. 23, 1971. Continuation of Ser. No. 672,920, Apr. 1, 1976, abandoned. Application for reissue Nov. 16, 1979, Ser. No. 95,200

Int. Cl.³ B65D *41/46*

U.S. Cl. 229—7 R **15 Claims**



13. A lid for a cup or the like comprising a thin disc, said disc having a peripheral flange formed on its edge around its periphery for frictional engagement with the rim of said cup to form a seal therewith for liquid contained in said cup.

an arcuate penetrating score line in said disc having terminal ends bounded by lines extending at an angle to each other from substantially the center of said lid, said arcuate score line extending adjacent said peripheral flange edge, and

a fold line formed of a chord of a circle subtending an arc between said terminal ends such that an opening bounded by the arcuate penetrating score line and said chord of a circle form an opening having a segmental flap, which opening is sufficient to permit fluid in said cup to flow substantially unimpeded to the mouth of the user and said segmental flap substantially prevents inadvertent spillage of the contents when said cup is nearly full with a liquid.

Re. 31,651

COMMUNICATION SYSTEM USING INTELLIGENT NETWORK PROCESSOR

Harold G. Alles, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 4,112,258, dated Sep. 5, 1978, Ser. No. 841,365, Oct. 12, 1977. Application for reissue Feb. 12, 1981, Ser. No. 234,016

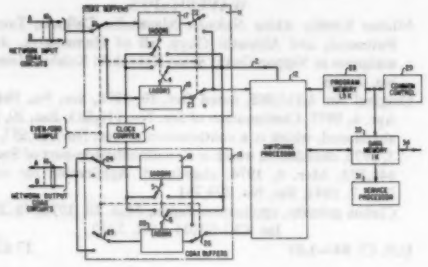
Int. Cl.[3] **H04J** *3/00*; **H04Q** *3/54, 11/04*

U.S. Cl. 370—66 **29 Claims**

1. A switch for interconnecting respective digital call signals of different communication call paths between randomly selectable switch ports corresponding to the paths, the switch comprising

means for storing the signals of input ports of said switch in a first predetermined series of storage locations, respectively.

means for variably processing said stored signals in accordance with *a* predetermined [subroutines] *separate subroutine for each call path* related at least to effecting said randomly selectable interconnecting of signals and op-



tionally selectable additional subroutines related to predetermined characteristics of a communication call of which said signals are a part, to produce processed call signals, and

means for storing said processed signals in a second predetermined series of storage locations corresponding to output ports, respectively, of said switch.

PLANT PATENTS

GRANTED AUGUST 21, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,273

SUGAR MAPLE NAMED FLAX MILL MAJESTY

Roger L. Ashton, Scotch Hill Rd., Cambridge, N.Y. 12816

Filed Mar. 8, 1982, Ser. No. 355,715

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of sugar maple tree, substantially as herein shown and described, characterized by the unique combination of relatively fast and dense growth in comparison to most sugar maple trees, a symmetrically shaped ovoid crown, freedom from frost cracking and by being extremely hardy, surviving in 38° F. below zero with no splitting or sun scald problems, and having very large leaves.

PATENTS

GRANTED AUG. 21, 1984

ERRATA

For CLASS	See PATENT NO.
446–046	4,466,212
446–056	4,466,213
446–437	4,466,214
446–469	4,466,215
016–114	4,466,377
273–256	4,466,515
162–198	4,466,873
502–011	4,466,903
502–074	4,466,907

PATENTS

GRANTED AUGUST 21, 1984

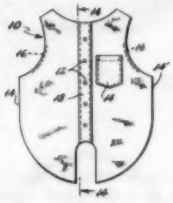
GENERAL AND MECHANICAL

4,466,135

BULLETPROOF DRESS SHIRT

Edward A. Coppage, Jr., 3031 Borge St., Unit 109, Oakton, Va. 22124

Filed Sep. 30, 1982, Ser. No. 428,924
Int. Cl.³ F41H 1/02
U.S. Cl. 2—2.5 **10 Claims**



1. A bulletproof shirt comprising: a front panel and a rear panel and connecting means releasably attaching said front panel to said rear panel;

Said front panel including:

(a) an outer layer including means incorporated thereon causing said outer layer to resemble a shirt;

(b) a middle layer including a portion of said connecting means;

(c) an inner layer including a first opening bounded by first and second means releasably fastening said opening in a closed configuration;

(d) said outer layer being permanently fastened to said middle layer at one location and said middle layer being permanently fastened to said inner layer to form a front panel containment area between said inner and middle layers accessible through said first opening;

Said rear panel including:

(a) an outer layer including a portion of said connecting means and further including third releasable fastening means;

(b) an inner layer including fourth releasable fastening means engageable by said third releasable fastening means;

(c) said inner and outer layers of said rear panel being permanently fastened together so that said third and fourth releasable fastening means engage one another and provide closable access to a rear panel containment area formed between said layers;

Said shirt further including removable bulletproof pads, a first said pad being removably inserted into said front panel containment area and a second said pad being removably inserted into said rear panel containment area;

Said front and rear panels being assembled to one another by engagement of said connecting means in said panels.

4,466,136

COMPOSITE T-SHIRT CONSTRUCTION

James T. Bottom, 452 Papworth Ave., Metairie, La. 70005; James J. Arnold, 511 Lowerline St., and Francis P. Thompson, 8715 Oak St., both of New Orleans, La. 70118

Filed Sep. 30, 1982, Ser. No. 428,891
Int. Cl.³ A41B 1/00
U.S. Cl. 2—115 **3 Claims**

1. A composite clothing article comprising:

a. a clothing article having on the surface thereof a graphical representation of a portion of an overall object to be displayed;

b. a three-dimensional, self-supporting member forming the remaining portion of the overall object to be displayed; and

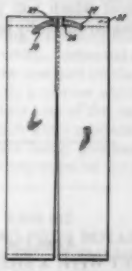
c. means for removably interconnecting the surface having the graphical representation and the self-supporting member such that the interconnected surface and the self-supporting member form the overall object to be displayed.

4,466,137

GARMENT WHICH CAN ACCOMMODATE A LARGE NUMBER OF WAIST SIZES AND WHICH IS HELD BY AN AUTOMATICALLY-ADJUSTABLE-LENGTH DRAWSTRING

Arturo S. Carnaghi, St. Louis, Mo., assignor to Angelica Corporation, St. Louis, Mo.

Filed Jul. 26, 1982, Ser. No. 401,871
Int. Cl.³ A41D 1/06
U.S. Cl. 2—237 **9 Claims**



1. A garment, which is adapted to enclose the lower portion of a user's body and to be held against slipping downwardly relative to said user's body by frictional engagement between the waist portion thereof and the waist of said user, and which comprises a body-enclosing section that is formed and dimensioned to enclose the lower portion of a user's body and that has a waist-engaging portion which is engageable with the waist of said user, said waist-engaging portion having a length encompassing a range of standard waist sizes of garments which enclose the lower portions of users' bodies, a drawstring which is longer than said waist-engaging portion and which has readily-flexible ends that can have differing lengths thereof tied to provide a desired effective waist size for said garment which is within said range of standard waist sizes, said drawstring having a resilient extensible section that is spaced inwardly from each of said readily-flexible ends of said drawstring, and means to hold said drawstring immediately adjacent to, and in register with, said waist-engaging portion while leaving the major portion of the length of said extensible resilient section free to move relative to said waist-engaging portion and hence free to move relative to said waist of said user, said resilient extensible section being extensible in length as said readily-flexible ends of said drawstring are moved relative to each other and then tied to cause said drawstring to urge

said waist-engaging portion against said waist of said user with sufficient force to provide a frictional engagement, between said waist-engaging portion and said waist of said user, which will keep said waist-engaging portion from slipping downwardly relative to said waist of said user, said resilient extensible section being adapted to automatically extend its length even further in response to instantaneous increases in the circumference of said user's waist as said user breathes inwardly or as said user moves his body, said resilient extensible section promptly and automatically reducing its length in response to subsequent decreases in the circumference of said user's waist as said user breathes outwardly or as said user moves his body, said waist-engaging portion experiencing finite and perceptible "bunching" or "crinkling" whenever said readily-flexible ends of said drawstring are moved relative to each other and then tied to cause said drawstring to urge said waist-engaging portion against the waist of a user who has a waist size close to the lower end of said range of standard waist sizes, the freedom of the major portion of the length of said resilient, extensible section to move relative to said waist-engaging portion enabling any "bunching" or "crinkling" of said waist-engaging portion to be distributed uniformly around said waist of said user and thereby make it possible to keep the amount of "bunching" or "crinkling" at any given point along said waist-engaging portion to a minimum, the automatic further extension of the length of said resilient extensible section and the subsequent automatic reduction of the length of said resilient, extensible section, in reponse to changes in the waist size of said user as said user breathes inwardly or breathes outwardly or as said user moves his body, enabling the tied flexible ends of said drawstring to resist accidental loosening thereof and also enabling said waist-engaging portion to maintain said frictional engagement which will keep said waist-engaging portion from slipping downwardly relative to said waist of said user.

4,466,138

SAFETY HELMET WITH A SHELL INJECTED FROM THERMOPLASTICS AND METHOD FOR THE MANUFACTURE OF SAID HELMET

Jean Gessalin, Touquin, France, assignor to G.P.A. International, Chevry-Cossigny, France

Filed Jun. 22, 1981, Ser. No. 275,679
Claims priority, application France, Jun. 24, 1980, 80 14041
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—243 R **6 Claims**

4. A method for manufacturing a helmet including a shell having an injected thermoplastics outer casing provided internally with a rigid insert of reinforced resin, including the steps of

premanufacturing a rigid insert of high strength reinforced resin,

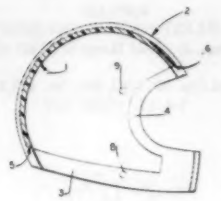
providing an injection mold having a male member and a female member defining a cavity having the shape of the shell,

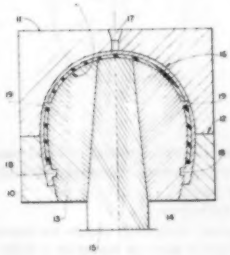
closely applying said insert onto the male member of said injection mold,

disposing in a manner known per se said male member covered with said insert in said female member so as to provide between the internal surface of female member and said insert a gap having a substantially constant thickness,

injecting said thermoplastics into said gap so as to fill the same and to mold said resin directly onto said insert, and

removing the assembly from said mold subsequent to cooling of thermoplastics,





whereby said insert is prestressed by the thermoplastics casing formed around said rigid insert.

4,466,139

VASCULAR PROSTHESES

Vettivetpillai Ketharanathan, 35 Degraves St., Parkville, Victoria, Australia

PCT No. PCT/AU80/00080, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO82/00091, PCT Pub. Date Jan. 21, 1982
PCT Filed Oct. 29, 1980, Ser. No. 305,634
Claims priority, application Australia, Jul. 1, 1980, PE4308
Int. Cl.³ A61F *1/00*
U.S. Cl. 3—1.4 **11 Claims**

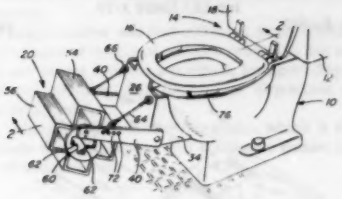
1. A vascular prosthesis suitable for use as a surgical graft, comprising a length of animal ureter which has been structurally modified and set to provide a smooth luminal surface and has been subjected to glutaraldehyde tanning.

4,466,140

ADJUSTABLE TOILET BOWL SEAT AND FOOTREST

Minoru Sakamoto, 3911 Nioi Place, Honolulu, Hi. 96816

Filed Mar. 28, 1983, Ser. No. 479,806
Int. Cl.[3] E03D *11/00*
U.S. Cl. 4—254 12 Claims



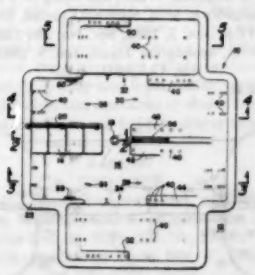
1. A toilet bowl assembly including an upwardly opening bowl member adapted to support an open seat member therefrom in vertical alignment with and above the open upper portion of said bowel and with said bowl defining front, rear and opposite side portions, a footrest assembly, said footrest assembly including a cantilever mount defining an upper portion removably engaged behind the upper lip of the front portion of said bowl and a lower portion having rearwardly facing surfaces abutted against forwardly facing surfaces of said front portion of said bowl below said upper lip, a pair of opposite side laterally spaced apart forwardly projecting generally horizontal arms including corresponding front and rear ends, means mounting the rear ends of said arms from opposite side portions of the lower portion of said mount with the front ends of said arms projecting forwardly from said mount, a multi-position footrest supported between the front ends of said arms for angular displacement relative thereto about a horizontal axis extending therebetween, said footrest including at least one pair of footrest surfaces facing generally radially outwardly of said axis and angularly spaced thereabout, said surfaces being spaced different radial distances from said axis.

4,466,141

HYDROTHERMAL TREATMENT FACILITY

Walter D. Starkey, 6504 S. Waco, Tulsa, Okla. 74132

Filed Jul. 12, 1982, Ser. No. 397,156
Int. Cl.[3] E04H *3/18;* E03C *1/02;* A61H *33/02*
U.S. Cl. 4—488 3 Claims



1. An enclosure for hydrothermal treatment of users comprising:

a vessel for containing heated water, the vessel having a floor and sidewalls and an upper circumferential ledge, the vessel being of depth so that the water level above the floor is about waist deep for the average user;

steps formed in a portion of one wall of said vessel extending from said upper ledge to said vessel floor whereby users may enter downwardly into said vessel;

the vessel being contoured to receive and support one or more users, including:

(a) a first portion having a lower surface raised about chair height above said floor and contoured in a generally horizontal plane to receive a user in a reclined position with both legs extended parallel and generally horizontally and with the user's back supported in an upwardly inclined manner so that the user's head is above water level, the wall adjacent such first portion having a narrow, horizontal ledge below water level providing means to support substantially the entire length of the left arm of a user;

(b) a second portion on the side of said vessel opposite said first portion having a lower surface raised about chair height above said floor and contoured in a generally horizontal plane to receive a user in a reclined position with both legs extending parallel and generally horizontally and with the user's back supported in an upwardly inclined manner so that the user's head is above water level, the wall adjacent such second portion having a narrow, horizontal ledge below water level providing means to support substantially the entire length of a user's right arm;

(c) a third portion having a chair height seat surface and a reclined back support surface extending upwardly therefrom, and having, extending from the chair height portion a narrow width horizontal surface for receiving the right leg of the user and, on the opposite side, and at a higher elevation, a narrow horizontal ledge for receiving the left arm of the user;

(d) a fourth portion having a chair height seat surface and a reclined back support surface extending upwardly therefrom, and having, extending from the chair height portion, a narrow width, horizontal surface for receiving the left leg of the user and on the opposite side and at a higher elevation, a narrow width horizontal ledge for receiving the right arm of the user; and

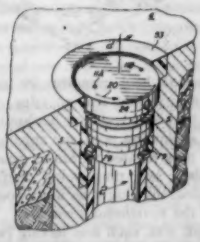
a plurality of jets by which water is injected into the interior of said vessel, the jets being positioned so that water flowing therethrough impenges on the joints of the users.

4,466,142

POOL CLEANING HEAD WITH ROTARY POP-UP JET PRODUCING ELEMENT

H. Daniel Gould, Phoenix, Ariz., assignor to Shasta Industries, Inc., Phoenix, Ariz.

Continuation of Ser. No. 194,679, Oct. 6, 1980,. This application Mar. 11, 1982, Ser. No. 356,967
The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.
Int. Cl.[3] E04H *3/20*
U.S. Cl. 4—490 4 Claims



1. A cleaning head for installation in a receptacle disposed in an under-liquid surface of a liquid container such as a swimming pool, the receptacle receiving liquid, the pressure of which is intermittently or periodically cycled between a rela-

tively low pressure and a relatively high pressure, said cleaning head comprising in combination:

(a) stationary means open at upper and lower ends thereof for removable connection in substantially sealed relation to said receptacle;

(b) pop-up jet producing means, having an outlet opening, rotatably, indexably disposed in said stationary means, for moving outwardly from the under-liquid surface in response to said relatively high pressure to expose said outlet opening and produce a concentrated, high velocity liquid jet along said under-liquid surface from said outlet opening;

(c) retracting means connected to both said stationary means and said pop-up jet producing means for retracting said pop-up jet producing means when said liquid pressure is cycled from said relatively high pressure to said relatively low pressure, said pop-up jet producing means rotating to following fixed positions in response to said cycling, thereby producing a plurality of successive, concentrated, high velocity liquid jets to clean a circular pattern around said cleaning head, said retracting means including a coil spring for urging said pop-up jet producing means towards its retracted position, said retracting means also including low-friction spring engaging means engaging opposed ends of said coil spring for transmitting opposed forces from said coil spring to said stationary means and said pop-up jet producing means and also effecting sufficiently low-friction rotational engagement between said pop-up jet producing means and said stationary means by said coil spring to avoid substantial winding of said coil spring as said pop-up jet producing means rotates; and

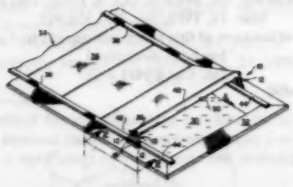
(d) first cramming means attached to said stationary means and second camming means attached to said pop-up jet producing means, said first and second camming means engaging each other to cause rotation of said pop-up jet producing means relative to said stationary means each time said pop-up jet producing means moves outwardly from the under-liquid surface in response to said relatively high pressure and/or is retracted by said retracting means.

4,466,143

SWIMMING POOL COVER LEADING EDGE WHEEL ASSEMBLY

Joe H. Lamb, 117 W. Fireclay Ave., Murray, Utah 84107

Filed Mar. 1, 1983, Ser. No. 470,989
Int. Cl.³ E04H *3/19*
U.S. Cl. 4—502 **10 Claims**



1. A leading edge wheel apparatus for use on a swimming pool cover having a raised leading edge, said leading edge being supported by an open-ended horizontal member which extends across a swimming pool, the apparatus comprising:

an expandable plug located within an open end of the horizontal member, said plug being configured such that, when expanded, the plug is securely positioned within the open end of the horizontal member,

at least one rigid arm, each arm having two ends;

a wheel rotatably connected to a first end of each rigid arm so as to be capable of rolling along a substantially horizontal surface; and

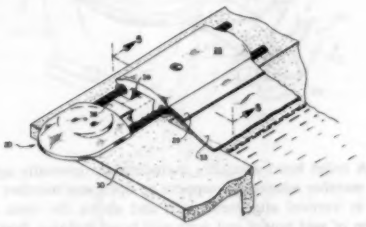
means for securing a second end of each arm to the expandable plug, said securing means both causing the expandable plug to expand and preventing movement of the arms with respect to the plug.

4,466,144

PULLEY ASSEMBLY FOR SWIMMING POOL COVER

Joe H. Lamb, 3500 Hillside La., Salt Lake City, Utah 84109

Filed Feb. 7, 1983, Ser. No. 464,757
Int. Cl.³ E04H *3/19*
U.S. Cl. 4—503 **16 Claims**



1. A swimming pool cover system comprising:

a cover having securement means along the longitudinal edges thereof, said cover further having draw cords attached thereto for use in extending the cover over a swimming pool;

a pair of tracks, one of said pair of tracks being secured on each side of the swimming pool, each track having a first channel adapted to receive the securement means of the cover and one portion of the draw cord in sliding engagement therein, and a second channel adapted to receive another portion of the draw cord, said track also having a slot situated between the first and second channels; and

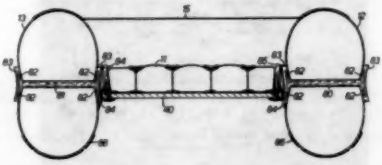
a pulley assembly secured at the end of each track, said pulley assembly including a housing and a pulley around which the draw cord travels as the draw cord passes from the end of the first channel and before entering the second channel, said housing having a projecting member adapted for engagement with the slot of the track so as to maintain the pulley assembly in proper alignment with respect to the track.

4,466,145

STRETCHER

David B. Jones, Rhondda, Wales, and Brian D. Powell, Carlisle, England, assignors to MFC Survival Limited, Rhondda, Wales

Filed Jun. 3, 1982, Ser. No. 384,536
Claims priority, application Japan, Jun. 9, 1981, 56-17596
Int. Cl.³ A61G *1/00*
U.S. Cl. 5—82 R **13 Claims**



1. A stretcher characterised in that it comprises:

(a) means for providing a rigid surface large enough to provide support to a supine human body over substantially the entire width and length of the body, comprising:

(i) a body board made up from at least three rigid, body support board portions which extend in a transverse direction across the full width of the body board and in

a longitudinal direction along a portion of the length of the board,

(ii) a hinge member disposed between each support board portions and the adjacent portion or portions along the length of the board, and

(iii) stiffening means for resisting downward movement of the board or each portion of the board, when the stretcher is in use and supported at its ends above the ground,

said hinge member and said stiffening means limiting the movement of the board portions relative to one another to movement between a compact, transport disposition of the stretcher and flat, useful disposition of the stretcher; and,

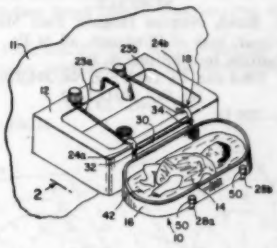
(b) an inflatable body cushioning means which is situated between the rigid surface and the supine human body in use of the stretcher.

4,466,146

PORTABLE BABY CHANGER

Patricia G. Regan, 25 Irving Dr., Woodbury, N.Y. 11796

Filed Jun. 21, 1982, Ser. No. 390,527
Int. Cl.³ A47C *29/00*
U.S. Cl. 5—98 B **1 Claim**



1. A portable baby changer which comprises:

(a) a collapsible frame that engages a front lip of a sink;

(b) an adjustable hook strap having an elastic member having having a hook affixed to each end of said elastic member that engages said collapible frame and one faucet of a sink;

(c) a container that is supported by said frame said container having the shape of a basket and constructed of flexible material having a pair of loops under said basket that engages said frame and when said basket is not used it can be folded up and placed into a diaper bag; and

(d) a pad having an inner stiff plate, a foam rubber coating affixed around said inner stiff plate to cushion a baby and a waterproof material cover affixed around said foam rubber coating to keep said foam rubber coating dry, said pad placed within said container so that a baby can be put within said container and have its diaper changed.

4,466,147

BED UNIT

Shinji Yokoi, 18, Arano, Kamiwada-cho, and Shinji Michida, 127 Yoshiden, Taki-cho, both of Okazaki City, Japan

Filed Dec. 28, 1981, Ser. No. 334,917
Claims priority, application Japan, Dec. 27, 1980, 55-189132
Int. Cl.³ A47C *19/06*
U.S. Cl. 5—147 **2 Claims**

1. A bed unit having a mattress positionable in a wall and on a floor for saving space comprising:

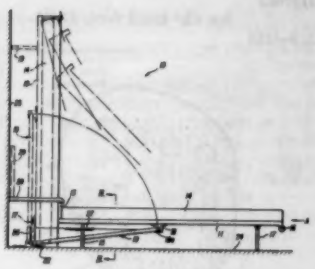
a frame on which said mattress is mounted;

a first support means for supporting said frame at a head side thereof;

a second support means for supporting said frame at a foot side thereof;

means for rotatably mounting said second support means to said frame;

driving means for moving said frame such that a head end portion of said frame is moved along said wall and a foot end portion of said frame is moved along said floor wherein said driving means further comprises a generally U-shaped stay having a central portion rotatably connected to said frame and opposite ends hingedly connected to said floor near said wall, and pulling means for rotating said stay from said floor to said wall wherein said pulling means further comprises spring means; and



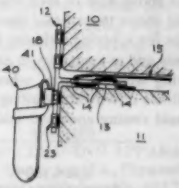
a pipe member connected to said floor wherein said spring means is disposed between said central portion of said stay and said pipe connected to said floor.

4,466,148

HANDGUN HOLSTER MOUNTING DEVICE

Donald G. Jones, 1405 W. Sixth St., Ontario, Calif. 91762

Filed Jan. 24, 1983, Ser. No. 444,993
Int. Cl.³ A47B *96/06*; B65D *19/44*
U.S. Cl. 5—503 **3 Claims**



1. A handgun holster mounting device for retaining a handgun holster in position adjacent to a mattress and mattress support, said holster mounting device comprising:

a pair of brackets positioned on opposite vertical surfaces of a mattress, at least one of said brackets being adapted for attachment of an elongated member thereto;

flexible means interconnecting said brackets, said flexible means disposed between the mattress and mattress support and serving to keep said brackets in position opposing each other;

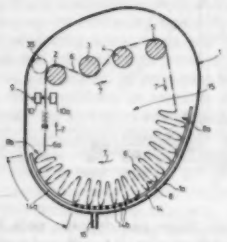
an elongated member affixed to at least one of said brackets, said elongated member being vertically adjustable with respect to the bracket to which said elongated member is affixed, and said elongated member serving as the supporting and retaining means for a handgun holster; and

attachment means for affixing said elongated member to said at least one of said brackets, said attachment means providing for easy disassembly and reassembly.

4,466,149
METHOD AND APPARATUS FOR RINSING TEXTILE MATERIAL

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,506
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137663
Int. Cl.³ D06B *1/02, 17/02*
U.S. Cl. 8—151 **20 Claims**



1. A method of rinsing an elongate web of textile material comprising introducing said web to a liquid free resting zone; moving said web from said resting zone following a rest period upwardly toward a web turning zone located at a level above that of said resting zone; and applying to the upwardly moving web only and at a rinsing zone between said resting zone and said turning zone a quantity of rinsing fluid, said quantity of rinsing fluid being in excess of that which said upwardly moving web can carry, whereby the excess of said rinsing fluid flows downwardly along the upwardly moving web between said rinsing zone and said resting zone.

7. Apparatus for the rinsing of an elongate web of textile material comprising a tank having therein means forming a web resting zone free of liquid; means for introducing said web to said resting zone; means for moving said web upwardly from said resting zone toward and beyond a rinsing zone located at a level above that of said resting zone; web turning means at a level above that of said rinsing zone; and means at said rinsing zone for applying a rinsing liquid to said upwardly moving web only and in a quantity in excess of that which said upwardly moving web can carry, whereby the excess of said rinsing liquid flows downwardly along the upwardly moving web between said rinsing zone and said resting zone.

4,466,150
TOOTHBRUSH

Alfred Jurt, Triengen, Switzerland, assignor to Trisa Bürstenfabrik AG, Triengen, Switzerland

Filed Oct. 4, 1982, Ser. No. 432,433
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3140903
Int. Cl.³ A46B *9/04*
U.S. Cl. 15—143 R **36 Claims**

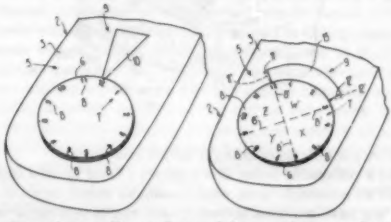
1. A toothbrush comprising:
a bristle support containing bristles;
a date-indicating arrangement possessing first marking means;
said first marking means indicating a number of mutually different time intervals;
said date-indicating arrangement possessing second marking means;
said date-indicating arrangement further including an indicator element rotatably mounted at said bristle support;
said indicator element being provided with one of both of said marking means;
the other of said marking means being provided at said bristle support; and

said one marking means being settable in relation to the other marking means provided at said bristle support upon rotation of said indicator element.

4,466,151
APPLICATOR FOR APPLYING A COATING TO A SURFACE

Herbert W. Barch, Natrona Heights; Emil Martin, and S. Thomas Greer, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 30, 1982, Ser. No. 394,029
Int. Cl.³ B05D *5/02*
U.S. Cl. 15—209 D **30 Claims**

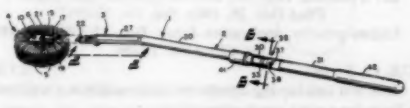


1. A coating applicator for applying coatings to substrates, comprising:
a. a core having two surfaces and adapted for being held,
b. a mat of sized glass fibers having fibers protruding from the surface of the mat where the protruding fibers have multidirectional orientation and where the mat is engaged to one of the surfaces of the core.

4,466,152
BOWL MOP

Theron C. Moss, Cleveland; Earl Boring, McDonald, both of Tenn., and Irwin Tomm, Cleveland, Ohio, assignors to Seco Industries, Inc., Cleveland, Tenn.

Filed May 3, 1982, Ser. No. 374,336
Int. Cl.³ A47L *13/24;* **B25G** *1/04, 3/12*
U.S. Cl. 15—229 A **20 Claims**



1. A cleaning device for use in cleaning toilet bowls and the like comprising a handle having a projecting end portion, and a disposable cleaning head attached to said projecting end portion, said projecting end portion having a longitudinal slot

in the outer end thereof, and said disposable cleaning head having a slide which is slidably received in said slot, one of said disposable cleaning head and said projecting end portion having a cam projection thereon, and the other of said disposable cleaning head and projecting end portion having a recess therein which is engaged by said cam projection to releasably secure said disposable cleaning head to said projecting end portion, said projecting end portion extending at an angle relative to the longitudinal axis of said handle to facilitate cleaning of difficult to reach areas such as under fixture edges and the like, said projecting end portion being made separately from said handle, said projecting end portion having a stub shaft on the end opposite said slot, said stub shaft being angularly disposed relative to the longitudinal axis of said projecting end portion and extending into the outer end of said handle for attachment thereto.

4,466,153

DEVICE FOR WIPING A VEHICLE WINDOW

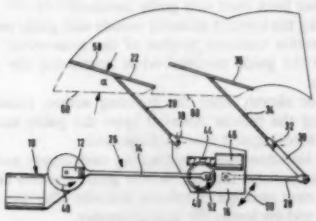
Horst Seibicke, Bühl-Altschweier, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,952

Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218373

Int. Cl.³ B60S *1/18*

U.S. Cl. 15—250.16 **6 Claims**



1. A device for wiping a vehicle window, comprising at least one wiping element lying against a window to be wiped; a drive unit; a transmission unit operatively interconnected between said drive unit and said wiping element so that a reciprocating pendulum motion is imparted to said wiping element pivoting between an advance holding position and a reverse holding position within a wiping zone; said transmission unit including a crank connected to said drive unit, said drive unit imparting a rotation motion to said crank, a coupling rod pivotally connected to said crank, and a rocking member pivotally connected to said coupling rod, said rocking member carrying at least one wiping shaft connected to said wiping element; means for transferring said wiping element from said reverse holding position to a park position located outside of said wiping zone, said transferring means being actuated after said drive unit has been switched off and including an adjustable joint mounted on said rocking member; and means for adjustment of said adjustable joint, said coupling rod and said rocking member being adjustably connected to said joint, said adjustment means including an adjustment drive, a worm connected to said adjustment drive, and a rotatable worm gear meashing with said worm and actuated thereby, a pivot pin pivotally connecting said worm gear to said rocking member, said worm gear and said adjustment drive being positioned on said rocking member.

4,466,154

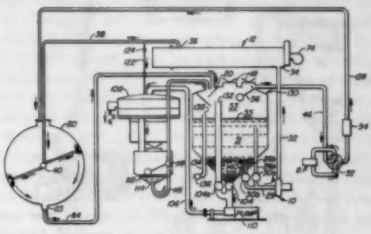
TANK CLEANING SYSTEM

William G. Urbani, 2520 Benjamin Holt Rd., Stockton, Calif. 95207

Continuation-in-part of Ser. No. 222,472, Jan. 5, 1981, abandoned. This application May 28, 1982, Ser. No. 382,900

Int. Cl.³ B08B *9/08*

U.S. Cl. 15—302 **10 Claims**



1. A cleaning system comprising:

a substantially sealed pressure vessel having a liquid outlet, a vacuum outlet and a suction inlet in fluid communication with the interior of said vessel, said vacuum outlet and said suction inlet communicating with an upper region of said vessel and said liquid outlet communicating with a lower region of said vessel;

first pump means, fluidly connected to said liquid outlet, for pumping a cleaning liquid from said vessel through a first line, said liquid partially filling said pressure vessel so that said vacuum outlet is above the free surface of said cleaning liquid;

means, fluidly connected to said vacuum outlet, for drawing a partial vacuum within said upper region of said pressure vessel;

solids separator means for removing solids from a mixture of solids and liquids;

pipe means for fluidly connecting an inlet of said solids separator means to said vessel, said pipe means adapted to pass a mixture of solids and said cleaning liquid from said vessel to said solids separator means; and

said solids separator means including a liquid outlet fluidly coupled to the interior of said vessel for drawing liquid from said solids separator means into said vessel.

4,466,155

RECYCLING CLEANING APPARATUS

Dale L. Grave, 1250 N. Queensland La., Plymouth, Minn. 55447

Filed Nov. 22, 1982, Ser. No. 443,224

Int. Cl.³ A47L *11/30*

U.S. Cl. 15—321 **5 Claims**

1. A recycling cleaning apparatus, having in combination

a cleaning fluid reservoir having a body of cleaning fluid therein,

cleaning means applied to a cleaning area,

a high pressure pump passing said cleaning fluid to said means,

a vacuum motor having means in connection with and drawing a vacuum upon said cleaning means and recovering said cleaning fluid from said cleaning area into said reservoir,

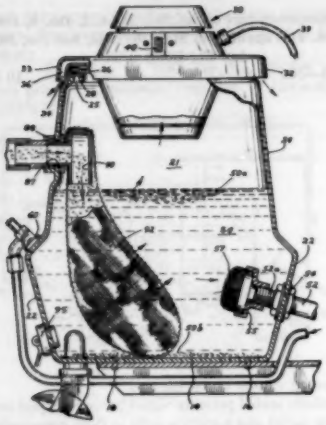
inlet filter means within said reservoir receiving and passing through said recovered cleaning fluid,

an outlet filter within said reservoir through which is drawn recycled cleaning fluid,

means cleaning the surface of said outlet filter,

said last mentioned means comprises a fluid stream,

means directing said stream to sweep the surface of said filter, and



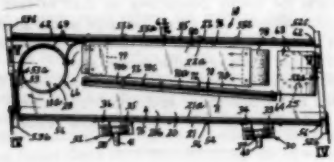
means passing said stream to said last mentioned means with sufficient velocity as to engage and cause said body of cleaning fluid to have motion.

4,466,156

AIR VELOCITY CONTROL MECHANISM FOR SELECTIVE DEBRIS PICKUP

Michael L. Blebert, Crystal, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Jan. 19, 1983, Ser. No. 459,237
Int. Cl.³ E01H *1/08*
U.S. Cl. 15—346 **14 Claims**



11. Apparatus for sweeping debris from a surface, said apparatus comprising:

a housing having a substantially closed top, a generally open bottom, and a plurality of side walls depending from said top;

a source of positive pressure air flow in said top adjacent one of said side walls;

a source of negative pressure air flow in said top adjacent a second side wall and opposite said source of positive pressure air flow;

a leading, debris-sweeping section extending between said sources of pressure air flow and forward from said positive pressure air flow source;

a trailing, debris-sweeping section extending between said sources of pressure air flow;

a skirt separating said sections from each other, said skirt being constructed and arranged to allow relatively heavy debris to pass thereunder to said trailing section; and

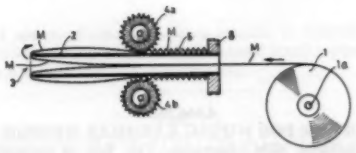
means, in said trailing section, for creating a velocity differential between said sections, said means including a member having a solid surface, said member effectively reducing the cross-sectional area of the flow path of said trailing section thereby increasing the velocity of the air flow therein.

4,466,157

METHOD OF PROCESSING ELONGATED TUBULAR MATERIAL AND DEVICE FOR PERFORMING SAID METHOD

Arnoldus J. B. M. Bos, Heusden-Zolder, Belgium, assignor to International Chemical Engineering Establishment, Vaduz, Liechtenstein

Filed Dec. 16, 1981, Ser. No. 331,348
Claims priority, application Netherlands, Dec. 17, 1980, 8006864
Int. Cl.³ A22C *13/02*
U.S. Cl. 17—49 **17 Claims**



1. A method of processing elongated tubular materials

passing the leading end of the tubular material from a supply package through the interior of a hollow guide member of annular cross-section toward one end of said guide member;

folding and thereby everting the leading end of the material at an everting point adjacent said one end of the guide member back over said guide member;

displacing the everted material outside said guide member in a direction contrary to that of the noneverted material inside the guide member while continuing the everting action;

during or shortly after the everting action, creasing and tucking the tubular material upon the guide member to form a corrugated new package; and

thereby simultaneously discharging said supply package of tubular material into the hollow guide member and forming a new package of tubular material after the everting point and enclosing the guide member.

8. A device for processing elongated tubular material, comprising:

a hollow mandrel having an open inlet end disposed adjacent a supply of tubular material for receiving the leading end of said tubular material into said hollow mandrel, said mandrel being open from end to end for movement of said tubular material therethrough, said hollow mandrel extending from said inlet end to a freely projecting open outlet end in turn having an everting edge for folding back said tubular material in an everted manner onto the outside of said hollow mandrel;

means spaced along said hollow mandrel between said everting end edge and inlet end for tucking the everted tubular material upon the outside of said mandrel or an extension thereof in a direction opposite the movement of tubular material inside said hollow mandrel.

4,466,158

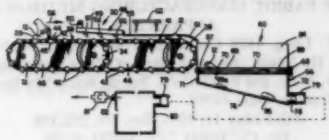
METHOD AND APPARATUS FOR SEPARATING VISCERA FROM AND SPLITTING GIZZARDS

Horace DeLong, Rte. 6, Box 257 A, Macon, Ga. 31201

Division of Ser. No. 115,960, Jan. 28, 1980, Pat. No. 4,325,165.
This application Apr. 16, 1982, Ser. No. 368,982
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—52 **7 Claims**

1. A method of treating poultry gizzards wherein the giz-

zards each define an opening comprising moving a series of gizzards on a surface conveyor along a path with the gizzard openings unobstructed and facing in the direction approximately opposite to the direction of movement of the gizzards, and cutting with a substantially stationary cutting blade into each gizzard generally toward its gizzard opening as the gizzard is moved along the path whereby solid objects in the gizzards tend to be expelled through the openings of the gizzards.



4. A method of splitting poultry gizzards wherein the gizzards have the viscera detached therefrom and each gizzard defines an opening at the position where the viscera was attached, comprising cutting with a cutting element into the gizzard at a position remotely located from the opening of the gizzard and cutting with the cutting element toward the opening of the gizzard and urging with the cutting element any solid elements present in the gizzard toward the opening of the gizzard.

4,466,159

ADJUSTABLE TIE STRAP

Robert H. Burrage, Stonewood Rd., MR57, York, Pa. 17402

Continuation of Ser. No. 281,022, Jul. 6, 1981,. This application Dec. 23, 1982, Ser. No. 452,498

Int. Cl.³ B65D *63/02*

U.S. Cl. 24—16 PB **1 Claim**

1. An adjustable tie strap operable from either end for securing furled sails, bundles, closed bags and sacks and the like comprising in combination, a strip of flexible plastic material of substantial length and tensile strength and uniform thickness and width provided with a series of similar rectangular openings having rounded corners extending therethrough longitudinally along said strip midway between the edges in evenly spaced relationship and the longest dimension of the openings extending longitudinally in said strip, the length of said openings being substantially equal to the width of said strip, and said strip also having a plurality of segments between said rectangular openings extending longitudinally along said strap and each segment being provided along the opposite edges thereof with an interrupted series of at least three similar notches of even depth in each segment and respectively opposite each other and the notches in said series being spaced longitudinally substantially closer than said rectangular openings are spaced and the portions of said strap between successive pairs of notches being no less in length than the width of said neck portions and the distance between successive pairs of notches is less than the length of said rectangular openings, the inner ends of said notches being rounded and spaced from each other across said strip a distance substantially equal to the transverse dimension of said rectangular openings to form a neck portion between said inner ends of said notches, the neck portion of the strap between opposite notches is of greater width than the portions of the strap respectively along opposite sides of said rectangular openings but less than the summation of the two portions on opposite sides of said openings, and the pairs of notches nearest the ends of said rectangular openings being spaced longitudinally from the ends of said openings a distance greater than the width of said neck portions, whereby substantially uniform tensile stress is afforded the strap which is determined by the strength of said neck portions, and when one end of said strap is twisted substantially ninety degrees to the plane of the strap adjacent a selected opening, either adjacent the opposite ends of the strap or otherwise, and then is pulled through said selected opening until a loop of said strap of desired size is formed and a pair of said notches is disposed in said selected opening to permit said strap to be twisted reversely substantially ninety degrees and thereby dispose the neck portion of said strap which is between said notches transversely across said selected opening to secure said loop of the strap tied around an object, the relatively close spacing of the notches of said series thereof affording close adjustment of the band around an article and said pairs of notches nearest the ends of said rectangular openings being spaced longitudinally from the ends of said openings a distance greater than the width of said neck portions.

4,466,160

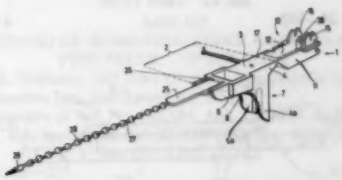
INTEGRAL BAG CLOSURE

Eduardo de Lima Castro Netto, Rua Sao Luiz Gonzaga No. 912, Rio de Janeiro, Brazil

Filed Jan. 22, 1981, Ser. No. 227,125

Int. Cl.³ B65D *77/10, 33/30*

U.S. Cl. 24—30.5 R **29 Claims**

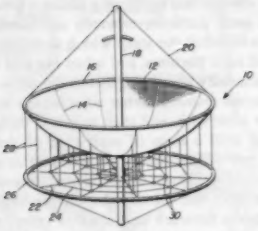


1. An integrally formed closure device for a bag, comprising a main part, a lever member, and an elongated band, the main part having a bag-engaging surface and the lever member being pivotally associable with the main part for movement between a first position adjacent the bag-engaging surface and a second position remote therefrom, the closure device further including resilient latching means operative between the lever member and the main part when the lever member is in the second position; said main part, said lever member, said elongated band and said latching means all being portions of an integral body of plastic material; at least one end of the elongated band being permanently attached to the main part, and attachment means comprising a closed slot being provided intermediate of the ends of the lever member to fix another point along the length of the band to the lever member, the band extending across the bag-engaging surface to define a closed loop therewith when it is so fixed and the lever member is associated with the main part, movement of the lever member from the first position to the second position serving to decrease the circumference of said loop.

4,466,161
MEANS AND METHOD FOR ADJUSTING AND CONNECTING CORDS

Benjamin C. Chambers, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Sep. 29, 1982, Ser. No. 426,538
Int. Cl.³ A43B *11/00*; F16G *11/04*
U.S. Cl. 24—115 R **10 Claims**

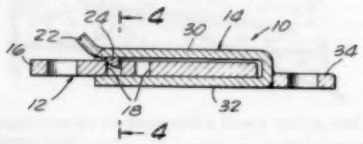


1. Means for adjusting and connecting cords comprising:
(a) a bead having holes therethrough sized for receiving said cords;
(b) clamping means attached adjacent said bead to each of said cords whose length is to be adjusted;
(c) at least one shim disposed between each said clamping means and said bead for adjusting said length of said cords, said clamping means and said shims being removable; and
(d) adhesive disposed in said holes for bonding said bead to said cords.

4,466,162
JEWELRY CLASP

Mardig V. Pogharian, and Vahan M. Pogharian, both of 8513 Fullbright Ave., Canoga Park, Calif. 91306

Filed Oct. 29, 1981, Ser. No. 316,329
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—585 **4 Claims**

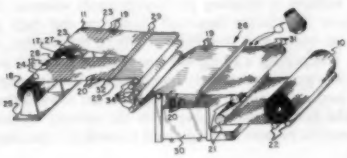


1. A Jewelry clasp comprising:
a longitudinal male member having an oblong planar form with an opening therein spaced from its outer end; and
a longitudinal planar female member receiving said male member, said female member having a longitudinal bottom wall, integrally formed parallel sides extending upwardly from the longitudinal edges of said bottom wall, and an integrally formed top including a longitudinal planar portion resting on the tops of said parallel sides and a short vertical portion connecting the inner end of said planar portion with the inner end of said bottom wall, said integrally formed bottom wall, parallel sides and top forming a chamber for receiving said male member that is open only at its outer end, the outer end of said planar portion of said top having an integrally formed pull-up lever thereon inclined upwardly from its surface, and an integrally formed stop member underneath for engaging said opening in the male member when it is inserted in the chamber in the female member, thereby locking the jewelry clasp with said male member closing said opening at said outer end of said chamber, the clasp being unlocked by engaging said pull-up lever and lifting the outer end of said top, said top being resilient acting and normally resting on said parallel sides.

4,466,163
WIDE FABRIC MANUFACTURING METHOD AND APPARATUS

Barry W. Long, 4458 Conestoga Trail, Copley, Ohio 44321; David H. Roush, deceased, late of Plain Township, Stark County, Ohio, and by Vivian J. Roush, heir, 1818 Broad Ave. NW., Canton, Ohio 44708

Filed May 11, 1981, Ser. No. 262,196
Int. Cl.³ D06H *7/00*; D03D *41/00*
U.S. Cl. 28—170 **14 Claims**



1. A method for making wide reinforcing fabric having warp cords spaced apart at a predetermined number of ends per inch comprising the steps of
placing at least a first fabric having first warp cords spaced apart at a first number of ends per inch and connected by first pick cords and a second fabric having second wrap cords spaced apart at a second number of ends per inch and connected by second pick cords on a letoff adjacent a loom, said first fabric and said second fabric being treated by dipping in a suitable adhesive and run through a chamber at controlled temperatures and tension for a predetermined time;
pulling said first fabric over a separating means to separate said first warp cords of said first fabric by cutting said first pick cords;
pulling said second fabric over a separating means to separate said second warp cords of said second fabric by cutting said second pick cords;
guiding said first warp cords and said second warp cords into said loom for joining the first fabric to the second fabric; and
weaving by using at least one dipped and treated weft cord with said first and second warp cords to provide a wide sheet of reinforcing fabric having a predetermined width greater than the width of said first or second fabrics and warp cords spaced apart at said predetermined number of ends per inch.

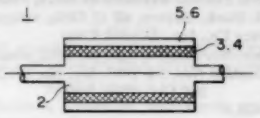
4,466,164
SUPERCALENDERING APPARATUS

Eiichi Tadokoro; Isao Yamamoto, and Keiji Tanaka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1981, Ser. No. 278,035
Claims priority, application Japan, Jul. 21, 1980, 55-99477
Int. Cl.³ B21B *27/02*
U.S. Cl. 29—132 **11 Claims**

1. In a supercalendering apparatus for smoothing the surface of a web by passing it through the nip between a metal roll and an elastic roll, the improvement wherein said elastic roll comprises a core metal roll having a first coating made of a fibrous material wound about said core roll and an inorganic filler

loaded epoxy resin impregnated in said fibrous material; and a second coating of an inorganic filler loaded epoxy resin having



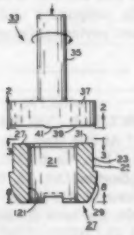
a ground surface and a thickness in a range of 0.5 to 5 mm formed on said first coating.

4,466,165

METHOD OF FORMING A BEARING

Charles W. Otto, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 12, 1982, Ser. No. 377,554
Int. Cl.³ B21D *53/10*
U.S. Cl. 29—149.5 PM **10 Claims**



1. A method of forming a bearing having a body of at least sintered powder metal, the bearing body including a plurality of surfaces and with interstices in the sintered powder metal defining a plurality of capillary flow path means for lubricant flow extending through the bearing body and communicating with the surfaces thereof, respectively, and at least one of the surfaces being a generally annular planar surface having at least one depression therein with the at least one depression extending generally radially across the generally annular planar surface, using tool means having a face with a rib of a hardened material extending therefrom, the method comprising the steps of:

placing the generally annular planar surface of the bearing body and the face of the tool means in juxtaposition and overlaying the rib of the tool means with a part of the generally annular planar surface;

rotating at least one of the bearing body and the tool means and moving at least one of the tool means face and the generally annular planar surface toward the other thereof;

rubbing the rib on the tool means face with the generally annular planar surface generally as the at least one of the bearing body and the tool means is rotated and entering the tool means rib into the at least one depression to effect the rubbing of at least a part of the at least one depression in the generally annular planar surface; and

displacing at least some of the sintered powder metal on the generally annular planar surface and in the at least part of the at least one depression in response to the rubbing thereof with the rib of the tool means and at least reducing thereby the size of at least some of the capillary flow path means communicating with the generally annular planar surface and the at least part of the at least one depression therein.

4,466,166

GRIP MOUNTING ASSEMBLY

Harold W. Hogarth, 5950 Clara, Bell Gardens, Calif. 90201

Filed May 22, 1981, Ser. No. 266,202
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—235 **2 Claims**

1. In combination with a racquet that has a handle of substantially square transverse cross section and an elongate elastomeric tube that has an interior transverse cross section less than that of said handle, a portable assembly for mounting said tube on said handle to define a grip, said portable assembly including:

a. a hollow elongate rigid guide that includes a first end portion of circular transverse cross section of such dimensions that said tube may be slideably mounted thereon, a second hollow end portion that removably telescopes over and engages an end extremity of said handle, said second end portion having a transverse cross section of the same shape as that of said handle and larger in cross-sectional area than said first end, and an intermediate portion increasing in cross-sectional area between said first and second end portions to provide a transition portion therebetween; and

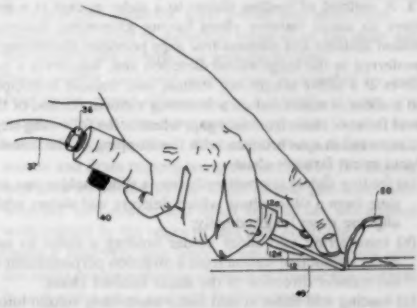
b. anti-friction means that comprising parallel laterally spaced strips that extend along the longitudinal length of the rigid guide and covers at least a portion of the exterior surface of said guide that permit said tube to be moved and expanded longitudinally along said guide from said first end portion of said second end portion and onto said handle to define a grip, with said guide being removable from said handle after said tube is positioned thereon for subsequent use in mounting elastomeric tubes on other racquet handles.

4,466,167

METHOD OF REMOVING STUCK GASKETS AND PNEUMATIC IMPACT TOOL

Brent K. Hoffman, Salt Lake County, Utah, assignor to Linear Pneumatics Inc., Salt Lake City, Utah

Continuation of Ser. No. 065,984, Aug. 13, 1979, abandoned.
This application Jul. 22, 1981, Ser. No. 285,754
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—275 **10 Claims**



1. A pneumatic impact tool, comprising a tubular housing adapted to be easily held in and manipulated by one hand of the user; an impact head rigidly secured in and extending outwardly from one end of said housing in fixed position relative to said housing, and provided with means for rigidly attaching

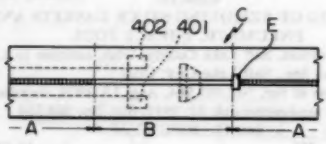
an implement to its outward end; valve means secured within said housing but spaced from said impact head so that a piston chamber is formed within said housing between said impact head and said valve means, said valve means having an inlet port adapted to be connected to a source of pressurized fluid and two outlet ports for the alternate release, respectively, of pressurized fluid, one of said outlet ports, but only one, opening directly into said piston chamber, and said valve means being adapted to provide automatic and rapid change in release of the pressurized fluid between the two outlet ports upon a release of pressure from the pressure side of said piston chamber; a piston freely slidably mounted within said piston chamber; passage means connecting that outlet port of the valve means which does not open directly into the piston chamber with the piston chamber immediately adjacent to the impact head; at least one exhaust port through said housing for exhausting pressurized fluid from said piston chamber after a predetermined amount of travel of the piston in each direction of its stroke thereby releasing pressure from the pressure side of the piston chamber to cause the valve to change the outlet port through which pressurized fluid is released; and means for connecting a source of pressurized fluid to said housing so that pressurized fluid enters the inlet port of said valve means.

4,466,168

METHOD AND APPARATUS FOR FEEDING SLIDERS TO SLIDER POCKET FOR ASSEMBLING SLIDERS ON AN UNCUT FASTENER CHAIN

Shingo Hatagishi, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,960
Claims priority, application Japan, Dec. 28, 1981, 56-214947
Int. Cl.³ B21D *53/54*; A41H *37/06*
U.S. Cl. 29—409 **4 Claims**



1. A method of feeding sliders to a slider pocket at a step where an uncut fastener chain having alternating fastening element sections and element-free gaps provided therealong is transferred in the longitudinal direction and, whenever a gap arrives at a slider assembling station, said transfer is stopped and a slider is assembled on a fastening element section of the uncut fastener chain from said gap, wherein the following steps are repeated in synchronism with the stopping of the transfer of said uncut fastener chain:

(a) feeding sliders intermittently into a slider holder one at a time from a slider chute which delivers said sliders while aligning them longitudinally;

(b) transferring said slider holder holding a slider to said slider assembling station from a direction perpendicular to the transfer direction of the uncut fastener chain;

(c) loading said slider at said slider assembling station into a slider pocket at the upper end of a slider pocket block which is raised from a direction perpendicular to both the direction of transfer of said uncut fastener chain and the direction of transfer of said slider; and

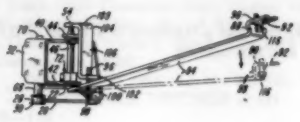
(d) returning said slider holder to the exit of said slider chute.

4,466,169

HINGE PIN REMOVAL METHOD

George L. Steck, Dayton; Raymond E. Steck, Miamisburg, and Laurence D. Steck, Dayton, all of Ohio, assignors to Steck Manufacturing Co., Inc., Dayton, Ohio

Division of Ser. No. 369,071, Apr. 16, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,342
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—426.5 **4 Claims**



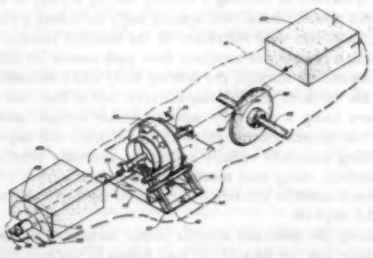
1. The method of removing an automobile hinge assembly of the type having a U-shaped hinge part and a hinge plate having wall means receiving therebetween flange portions of said U-shaped hinge part, having a hinge pin passing through said flange portions and said wall means and said hinge pin partially surrounded by a spring clip having outwardly struck fingers, said hinge pin having a nose at one end thereof and an enlarged head at the opposite end thereof, which comprises clamping said fingers inwardly, supporting said hinge assembly about said enlarged head, and prying said nose inwardly of said hinge assembly.

4,466,170

ADJUSTABLE CIRCULAR INSULATION SAW SYSTEM

Harry C. Davis, 8993 Airline Hwy., Baton Rouge, La. 70815

Continuation-in-part of Ser. No. 63,743, Aug. 6, 1979, Pat. No. 4,295,263. This application Oct. 13, 1981, Ser. No. 310,962
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.
Int. Cl.³ B23D *57/00, 3/02*
U.S. Cl. 29—561 **8 Claims**



1. A circular insulation saw apparatus for cutting blocks of insulation material into pipe insulation members comprising:

a. a frame with a material feed surface having first and second end portions and being supported by the frame, there being further provided a saw mount opening in the feed surface;

b. a powered, cylindrical cutting blade movably mounted with respect to the feed surface at the opening;

c. shaft means spanning the saw mount opening for at least partially providing support for the cutting blade;

d. a blade carriage positioned near the opening comprising at least one radial strut extending from the shaft to the cutting blade, and the adjustable means comprises a blade support slideable along the radial strut; and

e. adjustable means carried by the blade carriage for supporting the cutting blade in the opening so that the center of the circular blade substantially coincides with the planar surface, the adjustable means being movably supported to slide upon the carriage into a plurality of posi-

tions so that the carriage and adjustable means can accommodate cutting blades of varying diameters.

4,466,171

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING OUTDIFFUSION TO CONVERT AN EPITAXIAL LAYER

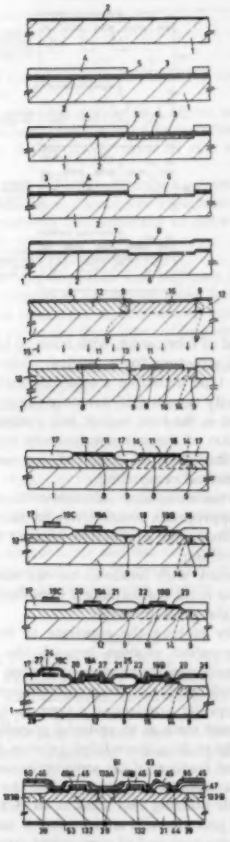
Pieter J. W. Jochems, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, Tarrytown, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,672

Claims priority, application Netherlands, Apr. 29, 1980, 8002492

Int. Cl.³ H01L *21/20, 21/225*

U.S. Cl. 29—571 **22 Claims**



1. A method of manufacturing a semiconductor structure, characterized as comprising the steps of:

introducing (1) a first dopant of a first conductivity type into part of a monocrystalline substrate region of a semiconductor body to define a first zone of the first conductivity type and (2) a second dopant of a second conductivity type opposite to the first conductivity type into part of the substrate region to define a second zone of the second conductivity type;

growing an epitaxial semiconductor layer on the substrate region such that the first and second zones are first and second buried zones, respectively;

causing the dopants to diffuse sufficiently into the epitaxial layer to establish (1) the entire portion overlying the first buried zone as a first epitaxial region of the first conductivity type and (2) the entire portion overlying the second buried zone as a second epitaxial region of the second conductivity type, the buried zones being sufficiently near each other that the epitaxial regions adjoin each other along substantially the entire thickness of the epitaxial layer to form a p-n junction, the species and concentrations of the dopants being so chosen that their lateral diffusions in the epitaxial layer substantially compensate each other fully along the p-n junction so that it is substantially perpendicular to the upper surface of the epitaxial layer; and

forming at least one surface-adjacent zone of at least one electronic circuit element in at least one of the epitaxial regions, the resulting upper surface of the epitaxial layer being a monocrystalline semiconductor surface.

4,466,172

METHOD FOR FABRICATING MOS DEVICE WITH SELF-ALIGNED CONTACTS

Tarsaim L. Batra, Cupertino, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 001,840, Jan. 8, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,388

Int. Cl.³ H01L *21/283, 21/318, 29/78*

U.S. Cl. 29—571 **12 Claims**

1. A method for fabricating an integrated circuit semiconductor device having a plurality of field effect transistor (FET) elements with self-registering electrical contacts on their source and drain regions and their gate electrodes connected to the device interconnection lines, said method comprising the steps of:

forming a patterned layer of field oxide on a semiconductive substrate of a first conductivity type in order to form active areas free from said field oxide on the substrate surface for the formation of said FET elements;

forming a relatively thin gate dielectric layer within said active areas;

forming a layer of conductive material over the surface of the substrate;

patterning said layer of conductive material into conductive gate electrodes of a predetermined shape and thickness, over said gate dielectric layer within said open areas;

forming a first layer of dielectric material on the sides and top of each said conductive gate electrodes;

forming, within each said active area surrounded by said field oxide, doped silicon source and drain regions of a second conductivity type material opposite to said first conductivity type of said substrate, the boundaries of said source and drain regions being determined by the edge of said field oxide and by the edges of said gate electrodes whereby said source and drain regions are self-aligned with respect to the edges of said gate electrode;

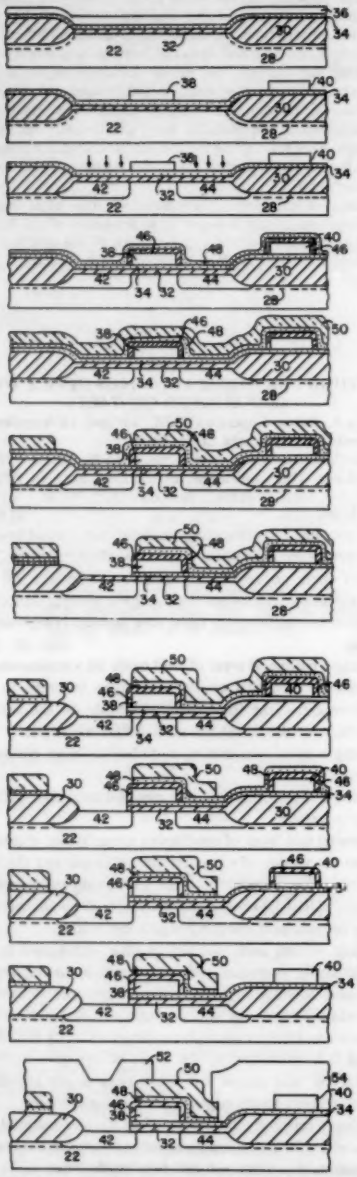
forming a relatively thin layer of protective material over the entire device including all areas of conductive material in said active areas and said field oxide areas;

covering said thin layer of protective material on said device with a relatively thick layer of insulating material;

forming oversized contact openings through said insulating material over said gate electrode and over said source and drain regions where electrical contacts are to be formed;

removing said second layer of dielectric material within said oversized contact openings;

removing said gate oxide from the surfaces of said source and drain regions with said oversized contact openings; and



depositing a metallic-type, high-electrical conductivity interconnection line pattern on the surface of the wafer extending into said contact openings thereby forming electrical connections with said source and drain regions within said contact openings.

4,466,173

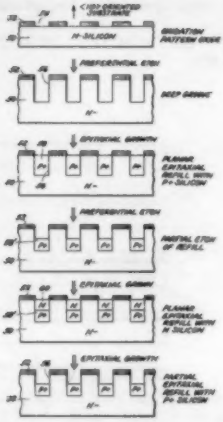
METHODS FOR FABRICATING VERTICAL CHANNEL BURIED GRID FIELD CONTROLLED DEVICES INCLUDING FIELD EFFECT TRANSISTORS AND FIELD CONTROLLED THYRISTORS UTILIZING ETCH AND REFILL TECHNIQUES

Bantval J. Baliga, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,328

Int. Cl.³ H01L *21/20, 21/74*

U.S. Cl. 29—571 **18 Claims**



1. A method of fabricating, with minimal autodoping effect, a buried grid structure for a vertical channel electric field device of the type including a semiconductor base region of one conductivity type, a grid structure of opposite conductivity type buried in the base region, and a substantially uniform electrode region of the one conductivity type but of higher conductivity than the base region at one surface of the base region, said method comprising:

providing a semiconductor substrate of the one conductivity type, of appropriate conductivity for the base region, and of crystallographic orientation selected to facilitate preferential etching;

forming a mask with windows on one surface of the substrate, said mask constituting a combined etchant barrier and epitaxial growth barrier;

preferentially etching the substrate to form substantially vertically-walled grooves beneath the windows while utilizing said mask as an etchant barrier;

epitaxially refilling the grooves with semiconductor material of the opposite conductivity type to form grids while utilizing said mask as an epitaxial growth barrier;

preferentially etching the refilled grooves to remove a predetermined fraction of the semiconductor material of the opposite conductivity type to define the thickness of the grids while utilizing said mask as an etchant barrier;

refilling the grooves with semiconductor material of the one conductivity type and of appropriate conductivity for the base region by means of vapor phase epitaxial growth so as to bury the grids while utilizing said mask as an epitaxial growth barrier, the refilling material of the one conductivity type and the substrate surrounding the grooves together defining the base region;

removing said mask;

forming a substantially uniform region of the one conductivity type but of higher conductivity than the base region in the surface of the base region to form the electrode region; and

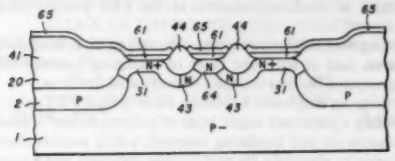
forming contacts to the buried grids.

4,466,174

METHOD FOR FABRICATING MESFET DEVICE USING A DOUBLE LOCOS PROCESS

Henry M. Darley, Plano, and Theodore W. Houston, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1981, Ser. No. 334,948
Int. Cl.³ H01L 21/26
U.S. Cl. 29—571 8 Claims



5. A method for fabrication of MESFET devices, comprising the steps of:

forming a first insulator layer on a silicon substrate;

forming a second insulator layer on said first layer;

patterning to define device areas in said second insulator layer;

introducing a p-type dopant into the substrate through said first insulator layer, then removing remaining photoresist;

thermally oxidizing the substrate to provide a patterned thick field oxide;

patterning said second insulator layer;

implanting n-type dopant in said substrate to create source and drain regions of the device being fabricated;

removing the remainder of said second insulator layer and forming a patterned third layer of insulator over said first insulator layer;

introducing n-type dopant in said substrate to determine device series resistance;

thermally oxidizing to create oxide partitions between source, gate, and drain areas of said device;

removing said third insulator layer;

implanting an n-type dopant in the substrate under the device gate region to form the device channel;

removing the remainder of said first insulator layer;

depositing a layer or metal over the device area, and sintering to form metal silicide over areas where metal is in contact with substrate and did not form silicide;

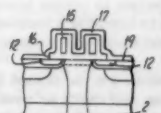
forming a patterned layer of metal to form device contacts and interconnections between devices.

4,466,175

MANUFACTURE OF VERTICAL INSULATED GATE FIELD EFFECT TRANSISTORS

David J. Coe, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,122
Claims priority, application United Kingdom, Jun. 17, 1981, 8118595
Int. Cl.³ H01L 21/265
U.S. Cl. 29—571 12 Claims



1. A method of manufacturing an insulated gate field effect transistor including a semiconductor body having source and drain zones respectively adjoining opposite major surfaces of said body comprising the steps of

providing a semiconductor body of a first conductivity type with a first insulating layer at portions of a first major surface of said semiconductor body,

forming regions of a second conductivity type in said first major surface at portions free of said first insulating layer,

removing said first insulating layer and forming a second insulating layer on said first major surface,

forming a polycrystalline semiconductor layer on said second insulating layer,

forming a masking layer on said polycrystalline layer between said regions of said second conductivity type,

removing unmasked portions of said polycrystalline layer,

forming gates of the transistor at masked portions of said polycrystalline layer by laterally diffusing a doping element of said second conductivity type into said polycrystalline layer beneath two opposite edges of said masking layer to a predetermined distance,

wherein said polycrystalline layer initially has a relatively high resistivity and said gates include pairs of relatively low resistivity conductive strips portions of said laterally diffused portions of said polycrystalline layer,

introducing into said semiconductor body impurities of said first conductivity type to form source zones and impurities of said second conductivity type to form zones of said second conductivity type at least partially below said gates, said impurities of said second conductivity type being introduced in the presence of said masking layer, and said zones of said second conductivity type overlying said regions of second conductivity type, said zones having a lower doping then said regions,

removing said masking layer and said polycrystalline layer free of said gates,

forming an insulating layer over said gates,

forming a first electrically conductive layer in contact with said source zones, and

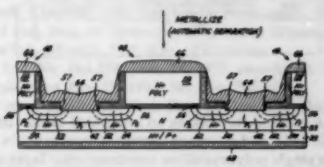
forming a second electrically conductive layer at a second major surface of said semiconductor body in contact with a drain zone of said semiconductor body.

4,466,176

PROCESS FOR MANUFACTURING INSULATED-GATE SEMICONDUCTOR DEVICES WITH INTEGRAL SHORTS

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 406,734, Aug. 9, 1982, abandoned, which is a continuation of Ser. No. 396,179, Jul. 7, 1982, abandoned. This application Jun. 9, 1983, Ser. No. 502,834
Int. Cl.³ H01L 21/223, 21/265
U.S. Cl. 29—571 22 Claims



1. A self-aligned process for manufacturing an insulated-gate semiconductor device including an integral short, said process comprising:

providing a semiconductor wafer including a first region of one conductivity type having a principal surface, and preparing the wafer by successively forming on the principal surface at least a gate insulating region layer and a conductive gate electrode layer;

forming on the wafer an etch resist mask having openings defining the ultimate locations of upper electrode regions, and then initially etching in areas defined by the mask openings through the conductive gate electrode layer and the gate insulating region layer to the principal surface;

removing the etch resist mask;

introducing into the first region impurities appropriate to form a shorting region of the opposite conductivity type, with unetched portions of the gate electrode layer serving as a mask during the introduction of shorting region impurities;

forming a mask at the shorting region surface, with the unetched portions of the conductive gate electrode layer serving as a mask during the forming of the mask at the shorting region surface;

laterally etching the previously un-etched portions of the gate electrode layer to define insulated gate electrode structures extending upwardly from and spaced along the principal surface, and spaced from the mask at the shorting region surface;

introducing into the first region between the gate electrodes impurities appropriate to form base regions of opposite conductivity type and impurities appropriate to form upper electrode regions of the one conductivity type within the base region, the gate electrode structures and the mask at the shorting region surface serving as masks during the introduction of impurities, with portions of the upper electrode regions extending laterally under the mask at the shorting region surface, and with the base regions and corresponding shorting region forming a continuous region of the opposite conductivity type below the principal surface, and thermally selectively oxidizing at least the gate electrode sidewalls;

removing the mask at the shorting region surface; and

forming a metallized upper electrode region terminal in ohmic contact with the upper electrode and shorting regions, and forming a metallized gate terminal in ohmic contact with the gate electrode.

4,466,177

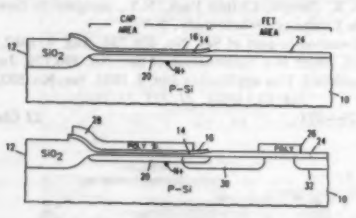
STORAGE CAPACITOR OPTIMIZATION FOR ONE DEVICE FET DYNAMIC RAM CELL

Hu H. Chao, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,735

Int. Cl.³ H01L *21/94*

U.S. Cl. 29—571 **22 Claims**



12. A method for making an integrated circuit comprised of a single FET and a storage capacitor integrated in a structure using a single polycrystalline semiconductor layer wherein the capacitor insulator and the FET gate dielectric insulator are different, without requiring an additional masking step in the method, said method comprising the steps of:

forming at least one layer of insulating material on a semiconductor substrate of a first conductivity type,

forming a patterned mask on said at least one layer of said insulating material.

said patterned mask having an opening in the area of said semiconductor substrate where said storage capacitor is to be formed and covering the area of said semiconductor substrate where said FET is to be formed,

ion implanting said semiconductor substrate through said opening to produce an opposite conductivity region in said semiconductor substrate which is one electrode of said storage capacitor,

depositing a masking layer through said opening in said mask to protect said at least one layer of insulating material in the capacitor area during a subsequent etching step,

removing said patterned mask to expose said at least one layer of insulating material in the FET portion of said circuit,

etching said at least one layer of insulating layer in said FET area, said at least one layer of insulating material being protected by said masking in said capacitor area,

forming an additional insulating layer in said FET area,

forming a patterned single layer of polycrystalline semiconductor on said insulating material, a first portion thereof being an electrode for said storage capacitor and a second portion thereof being a gate electrode for said FET,

forming current flow electrodes in said semiconductor substrate, and

providing electrical contact to said current flow electrodes.

4,466,178

METHOD OF MAKING EXTREMELY SMALL AREA PNP LATERAL TRANSISTOR BY ANGLED IMPLANT OF DEEP TRENCHES FOLLOWED BY REFILLING THE SAME WITH DIELECTRICS

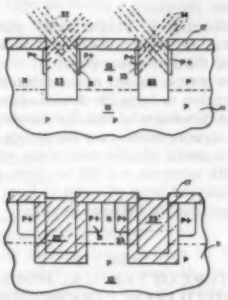
Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 25, 1981, Ser. No. 277,380

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ H01L *21/22, 21/31*

U.S. Cl. 29—576 B **6 Claims**



1. A method for forming an array of sub-micron dimensioned PNP lateral transistors on a substrate doped P type, wherein each transistor is formed comprising the following steps:

implanting N type impurities into the substrate for a given depth;

masking the substrate to outline boundary regions for each active region to comprise a transistor;

slotting the substrate in said boundary region beyond said depth;

doping the substrate via the slotted boundary regions to a depth less than said depth to render regions of the substrate adjacent the boundary regions above said depth P+ doped;

said doping being achieved by ion implant at angles to the direction of the slot such that the implanting is confined to upper portions of each slot above said given depth due to shadow effect;

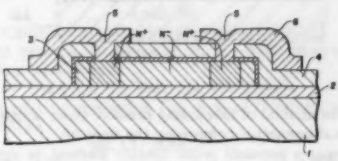
filling the doped slotted boundary regions with field oxide;
doping the active region of each transistor N+ type adjacent the substrate surface which is slotted except for the P+ portions thereof;
metallizing and patterning said substrate surface to provide electrical connections to each of said P+ regions and to said N+ region.

4,466,179

METHOD FOR PROVIDING POLYSILICON THIN FILMS OF IMPROVED UNIFORMITY

Alan J. Kasten, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 19, 1982, Ser. No. 435,221
Int. Cl.³ H01L *21/265*; B23K *27/00*
U.S. Cl. 29—576 T **5 Claims**



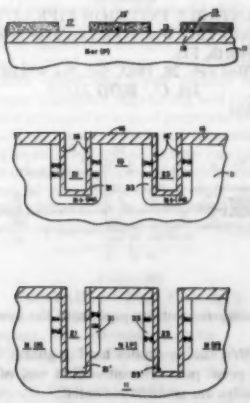
1. A method of forming a polysilicon thin film semiconductor device precursor, comprising:
depositing a thin film of polysilicon on a substrate;
irradiating an area of said film a first time by scanning with a laser beam in a first direction; and
thereafter irradiating said area of said film a second time by scanning with a laser beam in a second direction biased with respect to said first direction.

4,466,180

METHOD OF MANUFACTURING PUNCH THROUGH VOLTAGE REGULATOR DIODES UTILIZING SHAPING AND SELECTIVE DOPING

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 25, 1981, Ser. No. 277,464
Int. Cl.³ H01L *21/22, 21/76*
U.S. Cl. 29—580 **5 Claims**



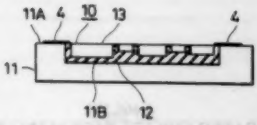
1. A method for forming an array of sub-micron dimensioned NPN or PNP lateral regulators in a substrate doped one type, wherein each transistor is formed comprising the following steps:
masking the substrate to outline a pair of opposed boundary regions for each active region to comprise a regulator;
slotting the substrate in said boundary regions to provide a pair of substantially parallel slots;
doping the substrate via the slots to render regions of the substrate adjacent the slots doped said one one type;
deepening the slots to extend beneath the doped adjacent substrate;
doping the substrate via the deepened slots to render regions of the substrate beneath and between the so-doped regions doped the other type;
slotting the substrate orthogonally to said slots by a further pair of slots thereby defining the regulator body;
filling the slots with field oxide;
metallizing and patterning said substrate to provide electrical connections to each of said one type regions.

4,466,181

METHOD FOR MOUNTING CONJOINED DEVICES

Shoji Takishima, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,346
Int. Cl.³ H01L *21/92, 21/14*
U.S. Cl. 29—589 **3 Claims**



1. A method of mounting semiconductive chips having respective one surfaces with bonding pads formed thereon to a wiring board with wiring layers formed thereon, which method comprises:
(A) positioning a plurality of semiconductive chips on a flat surface so that said respective one surfaces of said chips form a flat plane;
(B) making one conjoined body by connecting said semiconductive chips with insulative member filled between said semiconductive chips;
(C) removing said conjoined body from said flat surface;
(D) securing said conjoined body on said wiring board with flat plane of the conjoined body being faced upward; and
(E) forming wires which connect said wiring layers formed on said wiring board to said bonding pads formed on said semiconductive chips or connect said bonding pads to each other in a manner that said wires closely fit on said flat plane.

4,466,182

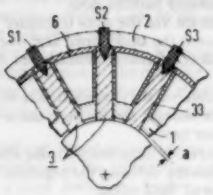
STATOR FOR AN ELECTRIC POLYPHASE MOTOR

Hans Lamatsch, Nuremberg; Helmut Schmidt, Reichenberg; Bodo Ulrich, Lengfeld, and Karl-Heinz Braungardt, Würzburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 865,258, Dec. 28, 1977, abandoned. This application Jan. 29, 1982, Ser. No. 343,909
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659384
Int. Cl.³ H02K *15/14*
U.S. Cl. 29—596 **7 Claims**

1. An improved method for constructing the stator for an electric polyphase motor, particularly a stepping motor, which includes a closed ring housing and pole piece star inserted therein, the pole piece star having axially integral pole pieces which are arranged in star-like fashion about and inserted into a hollow cylinder, comprising forming the hollow cylinder with axial slots extending through the cylinder and the interior wall thereof to the interior of the cylinder and the pole pieces in the axial slots of the hollow cylinder with their radial inner

edges extending into the bore diameter of the hollow cylinder and beyond the inner wall of the hollow cylinder by a predetermined small distance to provide air gaps without requiring further finishing operations of the hollow cylinder after the stator is assembled.

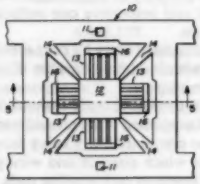


4,466,183

INTEGRATED CIRCUIT PACKAGING PROCESS

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 3, 1982, Ser. No. 373,921
Int. Cl.³ H01R *43/00*; H01L *23/50*
U.S. Cl. 29—827 **10 Claims**



1. In a process for tape automatic assembly of integrated circuits, including the steps of forming a metal assembly tape having a succession of metal finger patterns, each pattern having a plurality metal fingers that extend inwardly to form an array that mates with the bonding pads on an integrated circuit chip and that extend outwardly of said bonding pads to form package leads that will act to provide mechanical mounting as well as electrical contact means for said integrated circuit chip bonding said integrated circuit chip to said inwardly extending fingers so that said chip becomes a part of said metal assembly tape, applying packaging means to said assembly tape for encapsulating said integrated circuit chip and the inwardly extending portions of said metal fingers so that said outwardly extending portions extend beyond said packaging means, testing said encapsulated integrated circuit while attached to the tape, and finally excising said integrated circuit from said tape whereby said integrated circuit can be mounted in final form, the improvement comprising:

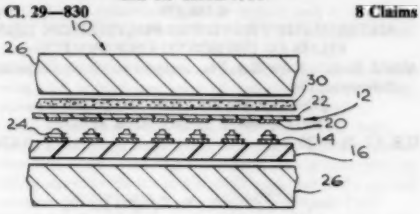
applying a strip of insulating material to the outer ends of said metal finger patterns prior to excising said integrated circuits from said tape whereby said package leads are held in position during subsequent testing, processing, and handling.

4,466,184

METHOD OF MAKING PRESSURE POINT CONTACT SYSTEM

Edward A. Cuneo, Westminster; Harold R. Montei, Rowland Heights, and Michael Olivieri, Alta Loma, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 257,055, Apr. 21, 1981,. This application Nov. 29, 1982, Ser. No. 445,441
Int. Cl.³ H05K *3/36*
U.S. Cl. 29—830 **8 Claims**



1. The method of fabricating pressure point contacts for an electrical connector comprising the steps of:

forming a pressure point contact element to develop an upraised portion having a narrow ridge thereon with bevelled sloping sides;

mounting a plurality of such elements on a plurality of first conductors;

applying solder to said elements and conductors and to a plurality of second conductors;

placing the first and second conductors in registration with each other in opposed juxtaposition, the upraised portions of the pressure point contact elements facing the second conductors;

positioning a pair of bars on opposite sides of the first and second conductors with a resilient pad located underneath one of the bars; and

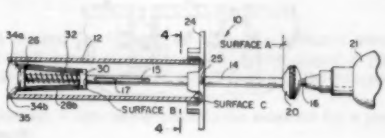
squeezing the bars together, thereby compressing the conductors and pressure point contact elements together, until the pressure point contact elements break through oxide layers on the soldered surfaces and cause the solder to cold flow to develop a gas tight seal.

4,466,185

ADJUSTABLE INTERIOR PIPE CUTTER

Richard Montiero, Lake Worth, Fla., assignor to RM Industries, Inc., Lake Worth, Fla.

Filed Feb. 28, 1983, Ser. No. 470,057
Int. Cl.³ B23D *21/14*
U.S. Cl. 30—103 **4 Claims**



1. A pipe cutter for cutting pipe from the inside out which comprises:

(a) two pivoted sliding guides having guides;

(b) a guide pivot post wherein a first end of two pivoted sliding guides are pivoted mounted;

(c) a cutter for cutting the inside of the pipe fixed to the end of each pivoted sliding guide and being generally perpendicular to the pipe to be cut;

(d) a driving slide member that slides within the guides of the pivoted sliding guide and imparts to the pivoted sliding

guides a rotational force so that the cutters will have the necessary force to cut into the pipe;

(e) a drive shaft that has a first end firmly attached to said driving slide member and a second end whereby a driving force may be exerted;

(f) a draw bar that has an aperture through its center whereby said drive shaft is inserted, said draw bar having one end externally threaded, said draw bar rotatably attached to said driving slide member;

(g) a spacer bar having an aperture through its center whereby said spacer bar is inserted over said draw bar;

(h) a cutter advance having an internal threaded aperture so that it screws onto the externally threaded draw bar so that when the cutter advance is turned said draw bar is moved towards the power source bringing with it said rotatably mounted driving slide member; and

(i) a driving source to power said drive shaft.

4,466,186

CHISELING OR TRIMMING MACHINE

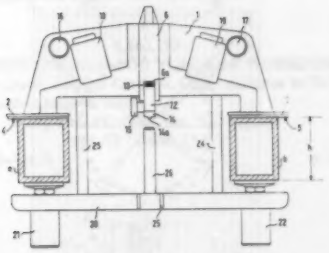
Leonhard Maurus, Blattergasse 9½, D - 8940 Memmingen, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,498

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014139

Int. Cl.³ B29C *17/12*

U.S. Cl. 30—124 **10 Claims**



1. A chiseling or trimming machine, intended in particular for deburring welded seams of polygonal frames comprising shaped plastic elements, said machine having a support surface on which the frame to be trimmed is placed against an arresting bracket and held immovably by means of holder cylinders, said machine further including a tool carrier displaceable in the working plane by means of a transport device, said tool carrier being arranged to yield upwardly, characterized in that said machine includes upper and lower parallel disposed crosspieces, said upper crosspiece supporting said tool carrier and a transport device arranged to extend perpendicularly relative to said crosspieces, said lower crosspiece supporting said arresting bracket by a cantilever means, at least one operator control handle on one of said crosspieces, said upper crosspiece further including terminal portions provided with support surfaces and said arresting bracket further including parallel rod means cooperating with said upper and lower crosspiece.

4,466,187

PORTABLE CIRCULAR SAW

Hiroyuki Morimoto, Hiroshima, Japan, assignor to Shindaiwa Kogyo Company, Ltd., Hiroshima, Japan

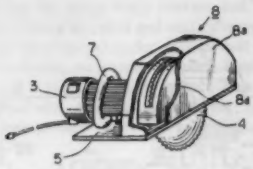
Filed Apr. 30, 1982, Ser. No. 373,786

Claims priority, application Japan, Apr. 30, 1981, 56-64944[U]; Apr. 30, 1981, 56-64945[U]

Int. Cl.³ B23D *45/16, 47/00*

U.S. Cl. 30—124 **1 Claim**

1. A portable circular saw comprising a dust collecting hood removably mounted on a table so as to fully contain the upper part of the rotary sawing cutter, an inner wall included in said dust collecting hood to surround the central part of the rotary sawing cutter from edge to edge, a dust collecting chamber provided in the dust collecting hood at the lower part thereof, said dust collecting chamber being constructed by a combination of the lower part of the dust collecting hood, the peripheral part of a bottom plate of the hood on the table and the inner wall, and a pair of semicircular plates fixedly secured to longer sides of the inner wall, said semicircular plates vertically extending along the rotary sawing cutter with a close clearance kept therefrom.



4,466,188

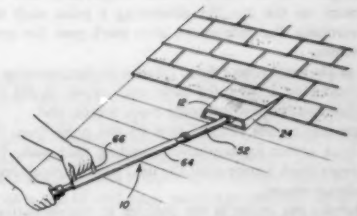
ROOFING REMOVER

Roger W. Svendsgaard, Fergus Falls, Minn., assignor to Albin H. Morrill, Fergus Falls, Minn., a part interest

Filed Jan. 24, 1983, Ser. No. 460,608

Int. Cl.³ A47L *13/02*

U.S. Cl. 30—172 **4 Claims**



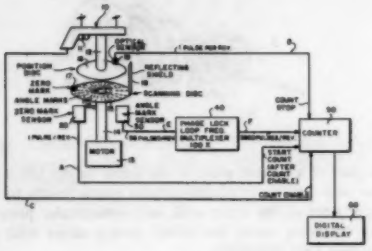
1. A roofing remover including a wedge head having upper and lower surfaces and front and rear ends, said upper and lower surfaces being forwardly convergent toward a forward transverse apex edge, a handle including base and free end portions, the base end portion of said handle being anchored relative to said head with the handle free end portion projecting rearwardly from said rear end of said head, the handle free end portion being rearwardly and upwardly inclined substantially 35° relative to said lower surface, said wedge head including forwardly tapering front-to-rear extending opposite side surfaces extending between said upper and lower surfaces, said side surfaces being rearwardly and upwardly convergent, said handle free end portion including an elongated weight body slidably mounted thereon for guided reciprocation back and forth along said free end portion, impact surface means on said handle engageable by said weight body to limit forward movement of said body relative to said handle, and a longitudinally split resilient sleeve removably snugly and laterally positionable about said handle between one end of said weight body and the opposing impact surface means.

4,466,189

ANGLE MEASURING DEVICE

Leo W. Tobin, Jr., c/o Sovran Bank, N.A., 3401 Columbia Pike, Arlington, Va. 22204

Filed May 29, 1981, Ser. No. 268,294
Int. Cl.³ G01C *1/00*
U.S. Cl. 33—267 **13 Claims**



1. A device for measuring the angle to a target, comprising:

a gun-like member having sighting and rotatable means for aiming at the target and a trigger switch actuatable for producing a pulse when the gun-like member is aimed at the target;

sensor means rotatable with the gun-like member about an axis for indicating the rotational position thereof;

a scanning disc rotating about an axis parallel to the axis of the sensor means and having thereon a zero mark, angle-indicating marks, and shield means, the shield means being cooperative with the sensor means for causing the sensor means to produce a pulse each time the scanning disc rotates the shield means past the sensor means;

a zero mark sensor fixed on a reference line from the rotational axis of the scanning disc from which the angle to the target is to be measured and cooperative with the zero mark on the disc for producing a pulse each time the scanning disc rotates the zero mark past the zero mark sensor;

an angle mark sensor fixed relative to the scanning disc for producing a pulse for each angle mark on the scanning disc rotated past the angle mark sensor; and

a counter means enabled first by the pulse from the zero mark sensor for thereafter counting each pulse from the angle mark sensor until the next pulse is produced by the sensor means,

whereby the count in the counter is representative of the angle to the target from the reference line.

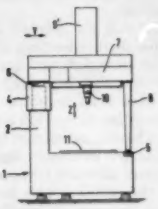
4,466,190

COORDINATE MEASURING MACHINE

Günther Ross, Oberndorf, and Manfred Schiementz, Epfendorf, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,403
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125681
Int. Cl.³ G01B *5/00*
U.S. Cl. 33—1 M **9 Claims**

1. A coordinate measuring machine comprising a basic frame structure having a steel track, crossbeam means supported on said basic frame structure including a bearing portion supported for traveling on said steel track, and a spindle sleeve carried on said crossbeam means, said basic frame structure comprising at least one cast part of synthetic resin concrete, said steel track being embedded in the cast part and a composition of said synthetic resin concrete being selected, at least adjacent said steel track to have a coefficient of thermal expansion of the concrete which is substantially equal to that of said steel track.

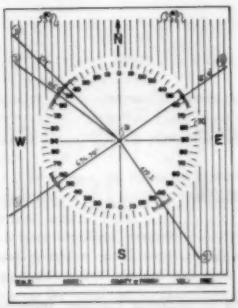


4,466,191

METHOD FOR CREATING A PLAT FROM A METES AND BOUNDS PROPERTY DESCRIPTION

James H. Frederick, 509 South 4th St., Crockett, Tex. 75835

Filed Jan. 10, 1983, Ser. No. 457,007
Int. Cl.³ G01C *15/00*
U.S. Cl. 33—1 B **10 Claims**



1. A method for drawing a plat from metes and bounds measurements of a property description, comprising:

drawing a plurality of lines on a first page containing a compass rose, each beginning at a center point on said compass rose and extending in a direction of a respective one of said metes and bounds measurements,

tracing at least a scaled length of each line corresponding to a distance of said respective one of said metes and bounds measurements, each in turn, end to scaled end, on a second page maintained in alignment with directions of said compass rose to form said plat.

4,466,192

METHOD OF ENHANCING THE PRODUCTION OF TYPESET RUNAROUNDS

Verkuilen B. Ager, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 21, 1983, Ser. No. 477,543
Int. Cl.³ G01B *5/26*
U.S. Cl. 33—1 B **4 Claims**

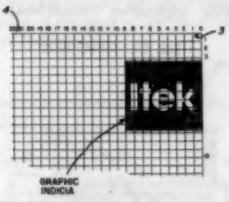
1. A method of facilitating, by means of a typesetter, the formatting of typeset text derived from text to be typeset having a given line spacing and having a runaround therein comprising the steps of:

a. providing a set of light-transmissive overlays having vertical and horizontal straight lines recorded thereon in rectangular grid configurations, each overlay having spacings

between said horizontal lines which differ with respect to the spacings between said horizontal lines of the other overlays;

b. selecting an overlay from said set having spacings between the horizontal lines thereof corresponding to said given line spacing of said text to be typeset;

c. superimposing the selected overlay over said text to be typeset at a position wherein the extreme edges of said



rectangular grid of said selected overlay are approximately aligned with the extremities of said text to be typeset, and said horizontal lines are parallel to said lines of text;

d. recording the desired indent relative to an edge of said rectangular grid for each line of text; and

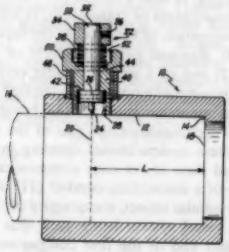
e. employing said recorded indents for each line of text during the operation of said phototypesetter to produce said runaround within said typeset text.

4,466,193

PRECISION SCRIBER FOR TUBULAR WORKPIECES

William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool, Inc., Rancho Cordova, Calif.

Filed Oct. 19, 1982, Ser. No. 435,257
Int. Cl.³ B43L *13/10*
U.S. Cl. 33—21 R **4 Claims**



1. A precision scriber for permanently marking the circumference of a tube end area at a precise distance from the end of such tube, comprising:

an annular socket body having an inner cylindrical wall and an end abutment projecting inwardly of the inner circumference of the cylindrical wall at one end area thereof, and being open for axially receiving a tube to be inscribed at the opposite end thereof, the socket body further including a radial aperture extending through said cylindrical wall at a predetermined precise distance from said abutment;

a precision scriber assembly mounted on said socket body at the location of said radial aperture;

said scriber assembly including a radially reciprocable scriber element including a hardened metal point connected to a cylindrical shank portion;

a plunger shaft connected to the shank portion, the plunger shaft extending outwardly of the socket body for manipulation during operation;

a close-fitting, radially extending cylindrical guide for said shank portion, said guide located at a predetermined precise distance from said abutment;

means for biasing said plunger shaft in a direction tending to withdraw the point from the interior of the socket body, the shank portion being radially movable against the spring bias to a sufficient extent to permit the point to project into the socket body interior; and

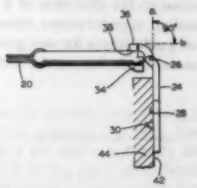
said aperture being threaded and said cylindrical guide comprising an externally threaded annular bolt having a lower portion including an interior cylindrical opening along its length and a higher portion including an axial opening; said cylindrical opening constituting said cylindrical guide; said plunger shaft extending through said axial opening.

4,466,194

TRUE ZERO TAPE HOOK

Edward C. Rutty, Portland, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 3, 1982, Ser. No. 414,785
Int. Cl.³ G01B *5/02*
U.S. Cl. 33—137 R **5 Claims**



1. An end assembly for a tape rule, comprising: a generally rectangular ring having one end adapted for attachment to the free end of a tape rule; and a hook, integrally formed from a single piece of material of uniform thickness, including a generally planar body portion having a substantially flat inner surface, and a hinge portion at one end thereof pivotably attached to the other end of said ring, said hinge portion being offset from said body portion a distance substantially equal to the thickness of said hook material and having a substantially flat outer surface extending thereacross and comprising a centrally disposed neck element inwardly curved to a generally cylindrical configuration, and a pair of shoulder elements disposed to either side of said neck element and providing abutment surfaces on said hook, said neck element encircling said other end of said ring to permit said hook to pivot thereabout between a closed position wherein said body portion abuts the intermediate portion of said ring, and an open position wherein said body portion extends at a right angle to the plane thereof, said abutment surfaces of said shoulder elements bearing upon said ring in said open position to restrain movement of said hook beyond a perpendicular relationship thereto, and said inner surface of said body portion and said outer surface of said hinge portion being disposed in planes that are perpendicular to one another and perpendicularly equidistant from the axis of pivoting of said hook about said other end of said ring, whereby said inner surface and said outer surface will lie in the same imaginary plane, generally perpendicular to the plane of said ring, when said hook is in said open and closed positions thereof, respectively.

4,466,195

MEASURING MACHINE OF THE PORTAL VARIETY

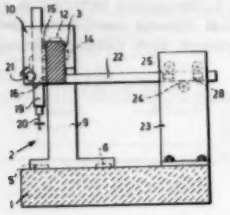
Klaus Herzog, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 445,683

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150978

Int. Cl.³ G01B 5/00

U.S. Cl. 33—174 L 10 Claims



1. In a measuring machine, a portal frame and a flat horizontal base, said portal frame comprising two upstanding columns slidable on said base and a horizontal bridge rigidly connecting said columns at vertical offset from said base, a movable carriage having y-axis guidance along said bridge, and a work-contact measurement head having z-axis vertical slide suspension from said carriage; x-axis guide means for said portal including a horizontal guide rail rigidly secured to said bridge and extending normal to the direction of y-axis guidance on said bridge, upstanding superstructure mounted to said base and including x-axis guide means for said guide rail; and means for determining lateral deviations in the x-direction guidance of the portal.

4,466,196

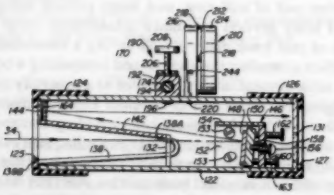
LASER ALIGNMENT SYSTEM FOR VEHICLES

James L. Woodruff, 240 Windward Passage #302, Clearwater, Fla. 33515

Filed Feb. 17, 1982, Ser. No. 349,592

Int. Cl.³ G01B 11/26

U.S. Cl. 33—288 13 Claims



1. An alignment system for measuring caster, camber, and toe-in readings of the wheels of a vehicle, comprising:

(a) a laser beam-emitting module for attachment to a wheel on one side of the vehicle, the laser module directing a laser beam in a generally horizontal plane toward the other wheel on the same side of the vehicle; and

(b) a sensor module secured to the other wheel on the same side of the vehicle to which the laser module is secured, the sensor module having a horizon-sensing means for measuring caster and camber, and an optical scale positionable in the path of the laser beam for measuring toe-in readings.

4,466,197

DEVICE FOR MEASURING OR DETECTING THE DEGREE OF INCLINATION OF AN OBJECT

Jackie Staempfli, Genève, Switzerland, assignor to Valinor, S.A., Vaduz, Liechtenstein

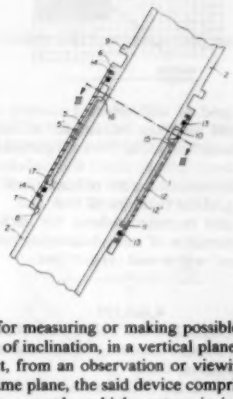
PCT No. PCT/CH81/00068, § 371 Date Dec. 17, 1981, § 102(e) Date Dec. 17, 1981, PCT Pub. No. WO82/01412, PCT Pub. Date Apr. 29, 1982

PCT Filed Jun. 18, 1981, Ser. No. 333,872

Claims priority, application Switzerland, Oct. 17, 1980, 7770/80

Int. Cl.³ G01C 9/20

U.S. Cl. 33—377 3 Claims



1. Device for measuring or making possible the calibration of the degree of inclination, in a vertical plane, of the axis of a tubular object, from an observation or viewing position situated in this same plane, the said device comprising a system of communicating vessels, which system is integral with the tubular object and contains a liquid, wherein said system is composed of a first tubular compartment (5) parallel to the axis of the tubular object, at least a part of the wall of the compartment (5) being transparent or translucent, in such a manner as to permit the observation of the level of the liquid, of an annular chamber (10), disposed perpendicularly of the axis of the tubular object (2) and of a second tubular compartment (12) parallel to and diametrically opposite to the first (5), the axes of the two tubular compartments (5) and (12) being situated in the vertical plane of inclination of the axis of the object (2), the upper ends of these compartments opening into the annular chamber (10) and their lower ends communicating with one another by way of a connecting conduit (11) disposed on the periphery of the tubular object, the quantity of the liquid in the communicating vessel system being such that its level is located at the upper end of the first compartment (5) for the minimal inclination of the axis of the object (2) relatively to the vertical and the ratio of the section of the annular chamber (10) to that of the first compartment (5) being sufficiently large for the variation of the level in this chamber, when the axis of the object (2) is subjected to an inclination, to be negligible in relation to the variation in level in the first compartment (5).

4,466,198

APPARATUS AND METHOD FOR DRYING LUMBER

Brendan L. Doll, 319 Appalachian Dr., Boone, N.C. 28607

Filed Mar. 7, 1983, Ser. No. 472,846

Int. Cl.³ F26B 3/34

U.S. Cl. 34—1 13 Claims

1. A method of drying a stack of lumber comprising the steps of

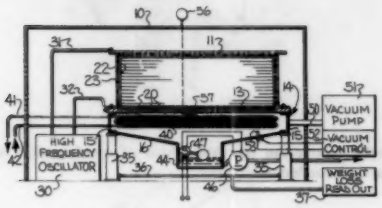
(a) enclosing at least a major portion of the stack of lumber in a flexible covering of impervious sheet material,

(b) positioning a first electrode plate against the outside of the flexible covering and at one side of the stack of lumber,

(c) positioning a second electrode plate at the other side of the stack of lumber, the peripheral edge of the second electrode plate being sealingly connected to the flexible covering and including spaced openings to permit the passage of water vapor and water therethrough,

(d) imposing a subatmospheric pressure within the impervoius covering and on the stack of lumber,

(e) applying high-frequency electric current across the stack of lumber by charging the electrode plates maintained on opposite sides of the stack of lumber to dielectrically heat the stack of lumber,



(f) withdrawing volatized water vapors extracted from the stack of lumber through the openings in the second electrode plate by means of the subatmospheric pressure and the dielectric heating steps,

(g) condensing the water vapor and withdrawing the water condensed from the water vapor, and

(h) continuing steps (b) through (e) until the stack of lumber is dried sufficiently to contain the desired moisture content.

4,466,199

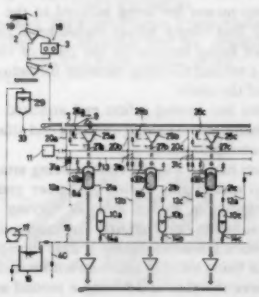
DEHYDRATION PROCESS FOR ORGANIC SOLID MATERIAL

Yasuyuki Nakabayashi, Yokohama; Yoshio Matsuura, Funabashi; Michio Kurihara, Mitaka; Takao Kamei, Ashiya; Akira Nakamura, Akashi; Keiichi Komai, Akashi; Akira Simotamari, Akashi, and Izumi Matsuno, Kobe, all of Japan, assignors to Electric Power Development Co., Ltd. and Kawasaki Jukogyo Kobushiki Kaisha, both of Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,772

Int. Cl.³ F26B *3/00*

U.S. Cl. 34—9 **7 Claims**



1. Process for dehydrating water-containing organic solid material which comprises the steps of providing a plurality of pressure vessels; performing liquid-form dehydration in at least one of said pressure vessels by putting the material into said one pressure vessel and applying saturated steam to said one vessel to heat the material so that water in the material is removed and mixed with condensate of the steam to be exhausted from said one vessel as waste water; transferring the waste water to a second pressure vessel in which the material is already charged but the saturated steam is not yet supplied to thereby preheat the material in the second vessel by the water; taking out the waste water from the second vessel and transferring it to a third vessel in which the material is not yet charged; charging the material into said third vessel in which the waste water is already charged so that pulverization of the material is prevented by the waste water when the material is charged into the third vessel while performing liquid-form dehydration in said second vessel.

4,466,200

PROCESS AND APPARATUS FOR DRYING A GRANULAR FREE FLOWING BULK MATERIAL

Giok-Khoen Khoe, Jac. v. Heemskercklaan 35, 2253 JX Voorschoten, Netherlands

PCT No. PCT/NL81/00009, § 371 Date Nov. 24, 1981, § 102(e) Date Nov. 14, 1981, PCT Pub. No. WO81/02924, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 3, 1981, Ser. No. 328,549

Claims priority, application Netherlands, Apr. 3, 1980, 8001980

Int. Cl.³ F26B *3/10, 17/10*

U.S. Cl. 34—10 **4 Claims**

1. In a process for convectively drying a granular free-flowing bulk material, wherein the bulk material passes downwardly through a silo and a vertically introduced, upwardly directed jet of hot drying gas is introduced into a lower part of the silo via a jet nozzle or jet aperture (orifice) in such a way that granules are entrained and recycled by said jet of hot drying gas and fall onto the surrounding bulk material, a tube having a wall closed along its entire length is inserted into the bulk material coaxially with the axis of the vertical gas jet and said tube is of such a length that it projects with its upmost end above the bulk material, the improvement which comprises the tube being adjustable to predetermined distances above the bottom of the silo, such that continuously an amount of the descending bulk material is drawn into the vertically introduced upwardly directed jet of hot drying gas is blown through the tube and is recycled on to the surrounding material.

4,466,201

METHOD AND AN ARRANGEMENT FOR STORING ORGANIC FIBROUS MATERIAL IN A STACK

Carl R. Larsson, Yxefall, S-590 40 Kisa, Sweden

PCT No. PCT/SE79/00107, § 371 Date Jan. 15, 1981, § 102(e) Date Dec. 29, 1980, PCT Pub. No. WO80/02573, PCT Pub. Date Nov. 27, 1980

PCT Filed May 15, 1979, Ser. No. 227,079

Int. Cl.³ F26B *5/00*

U.S. Cl. 34—27 **8 Claims**

7. Apparatus for controlling conditions within the interior of a stack of organic fibrous materials so as to (A) prevent spontaneous combustion of said materials, and (B) remove moisture from said materials, comprising in combination:

(1) An enclosure having a floor and a roof for accommodating said stack;

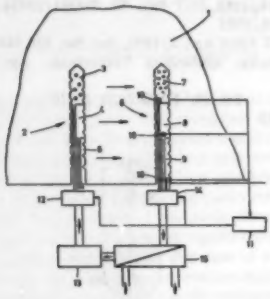
(2) A plurality of air delivery tube means, each of said air delivery tube means (a) being divided into a number of

axially separated chambers, and (b) having a number of outlet orifices over at least part of its length which communicate with respective of said chambers;

(3) A plurality of suction tube means, each of said suction tube means (a) being divided into a number of axially separated chambers, and (b) having a number of inlet orifices over at least a part of its length which communicate with respective of said chambers, said first and second pluralities of tubes being distributed throughout said stack, and separated from one another with their respective inlet and outlet orifices located at selected levels within said stack;

(4) Blower means having a high pressure side and a low pressure side;

(5) Conduit means connecting said plurality of air delivery tube means to said blower high pressure side;



(6) Conduit means connecting said plurality of suction tube means to said blower low pressure side;

(7) Valve means associated with each chamber of said air delivery tube means and said suction tube means, said valve means being operative in response to temperature measurements made at said suction tube inlet orifices;

(8) Temperature sensing means for measuring the temperature at said suction tube inlet orifices;

(9) Control means responsive to said temperature sensing means for controlling said valve means so as to maintain the temperatures at selected levels in said stack within predetermined temperature ranges; and

(10) Heat exchanger/de-moisturizer means located in line between said conduit means connecting said suction tube means and said blower low pressure side for extracting heat and moisture from the air withdrawn from said stack.

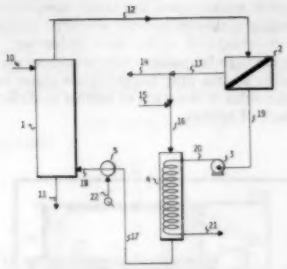
4,466,202

ENERGY-EFFICIENT EVAPORATION PROCESS WITH MEANS FOR VAPOR RECOVERY

Ulrich Merten, Pittsburgh, Pa., assignor to Bend Research, Inc., Bend, Oreg.

Filed Mar. 7, 1983, Ser. No. 473,030
Int. Cl.³ F26B *3/06*
U.S. Cl. 34—27 **37 Claims**

1. An energy-efficient process for the recovery of latent heat from a drying process comprising (1) contacting a material containing a volatile liquid with a gaseous drying medium and supplying heat to said drying medium or to said material and thereby producing an exhaust mixture of noncondensable gas and condensable vapor, (2) separating the condensable vapor in said exhaust mixture by passing it through a nonporous nonionic polymeric membrane which is substantially permeable to said condensable vapor and substantially impermeable to said noncondensable gas, (3) transferring said separated condensable vapor, together with the latent heat of condensation contained therein, to a compressor, (4) compressing in said compressor said separated condensable vapor, and (5) condensing said separated condensable vapor by heat exchange,



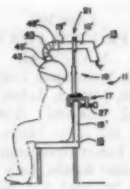
thereby recovering the latent heat of condensation of said separated condensable vapor.

4,466,203

STAND FOR A HAND HELD HAIR DRYER

Charles H. Thomas, 4036 Point Church, Memphis, Tenn. 38127

Filed Apr. 10, 1981, Ser. No. 253,032
Int. Cl.³ A45D *21/00*
U.S. Cl. 34—99 **1 Claim**



1. A stand for attaching a standard hand held hair drying unit to the back of a chair, said stand comprising:

(a) first clamp means for being secured to the back of the chair, said first clamp means including a first C-clamp member for being secured to the back of the chair and including a second C-clamp member for being secured to the back of the chair;

(b) a stabilizer bar having a first end attached to said first C-clamp member and having a second end attached to said second C-clamp member;

(c) neck means having a lower end for being attached to said first clamp means and having an upper end, said neck means including a sleeve member having a first end fixedly attached to said stabilizer bar and having a second end, said neck means including a slide member having a first end for being slidably received within said second end of said sleeve member and having a second end;

(d) second clamp means for being attached to said second end of said slide member of said neck means and for being secured to the hair drying unit;

(e) a bonnet means for placement over the hair of a person sitting on the chair; and

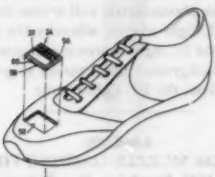
(f) a flexible hose means having a first end for being attached to said bonnet means and having a second end for being removably attached to the hair drying unit for distributing hot air from the hair drying unit to said bonnet means.

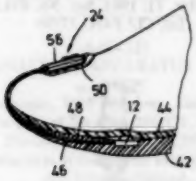
4,466,204

ELECTRONIC PACE AND DISTANCE COUNTING SHOE

Chyuan-Jong Wu, No. 15, Lane 41, Ta-Tung Rd., Fei-Sha Tsun, Su-Hu Hsiang, Yun-Lin Hsien, Taiwan

Continuation-in-part of Ser. No. 267,630, May 27, 1981, Pat. No. 4,402,147. This application Sep. 27, 1982, Ser. No. 424,102
Int. Cl.³ A43B 5/00, 23/00; G01C 22/00
U.S. Cl. 36—132 7 Claims





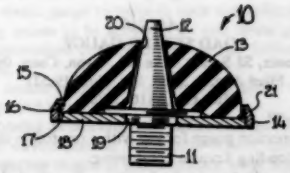
1. Apparatus adapted for disposition on a shoe, comprising:
a switch device, disposed proximate to the toe of said shoe, for generating a pace signal in response to each pace by said shoe;
an electronic device removably fixed in the toe of said shoe, removably connected to said switch device, and responsive to said pace signals, said electronic device comprising: means, responsive to said pace signals, for generating a pace count signal indicative of the number of paces;
a display device, viewably disposed on the top of said shoe, and responsive to input signals applied thereto, for providing indicia of said input signals; and
means for selectively applying said pace count signal to said display device as said input signal.

4,466,205

SAFETY STUD

George V. Corbari, 254 Cecil Place, Costa Mesa, Calif. 92627

Filed Jan. 10, 1983, Ser. No. 456,609
Int. Cl.³ A43C 15/02, 15/16
U.S. Cl. 36—134 6 Claims



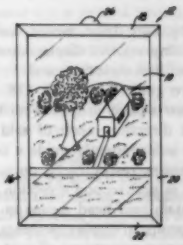
1. A cleat for use in sports shoes comprising:
a tapped bore substantially normal to said sole;
a plurality of cleats that are operatively associated with said plugs, each cleat including;
an external threaded boss means that extends upward from said cleat and is designed to engage said tapped bore;
a rigid tapered spike means that extends from said cleat in a direction opposite said boss means, with a horizontal end portion;
a domed body means of resilient material, but collapses when the individual walks on a soft surface, with a central hole through which the end of the spike protrudes;
a rigid flange means of substantially greater transverse cross section than that of the plug that has a central opening that fits on said boss holding the domed body in place;
a ring means encircling said flange and domed body trapping the bottom portion of the domed body against the flange means and holding the flange means in place against the domed body and an inward bent lip on top of the ring; and,
a disc means, with a central hole for accomodation of the threaded boss means said disc means is forceably fit into the bottom of the ring means placing the ring in tention, holding the ring, rigid flange, domed body and sports stud in permanent combination.

4,466,206

PICTURE FRAME

Roy N. Meadows, 900 Hearthside, South Lyon, Mich. 48178

Filed Sep. 8, 1982, Ser. No. 415,815
Int. Cl.³ G09F 1/12
U.S. Cl. 40—152.1 5 Claims



1. A picture frame for displaying a graphic comprising a plurality of interconnected marginal frame members, a substantially flat, transparent window affixed between said marginal frame members, a substantially flat closure back panel holding said graphic against said transparent window when said closure back panel is in a closed position, a latch member attached to one of said frame members and having a protruding portion retaining said closure back panel in said closed position, and a recess in said latch member for mounting said picture frame directly on a hanging post protruding from an adjacent wall, wherein said latch member is pivotably attached to said one of said frame members and is rotatable from a first position whereby said protruding portion retains said closure back panel in said closed position to a second position whereby said protruding portion frees said closure back panel and wherein said recess in said latch member is provided with converging sidewalls which guide a projecting end of said hanging post protruding from said adjacent wall to a predetermined position within said recess.

4,466,207

INFORMATION DISPLAY DEVICES

Hassan P. A. Salam, London, England, assignor to Unisplay S.A., Geneva, Switzerland

Filed Nov. 12, 1981, Ser. No. 320,480
Int. Cl.³ G09F 9/00
U.S. Cl. 40—449 17 Claims

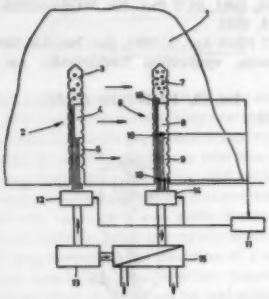
1. A display device, comprising
(a) a matrix panel (2, 102, 202, 302) containing a plurality of display elements (4, 104, 204, 304) arranged in horizontal and vertical rows to define said matrix, each of said display elements having first and second contrasting states;

axially separated chambers, and (b) having a number of outlet orifices over at least part of its length which communicate with respective of said chambers;

(3) A plurality of suction tube means, each of said suction tube means (a) being divided into a number of axially separated chambers, and (b) having a number of inlet orifices over at least a part of its length which communicate with respective of said chambers, said first and second pluralities of tubes being distributed throughout said stack, and separated from one another with their respective inlet and outlet orifices located at selected levels within said stack;

(4) Blower means having a high pressure side and a low pressure side;

(5) Conduit means connecting said plurality of air delivery tube means to said blower high pressure side;



(6) Conduit means connecting said plurality of suction tube means to said blower low pressure side;

(7) Valve means associated with each chamber of said air delivery tube means and said suction tube means, said valve means being operative in response to temperature measurements made at said suction tube inlet orifices;

(8) Temperature sensing means for measuring the temperature at said suction tube inlet orifices;

(9) Control means responsive to said temperature sensing means for controlling said valve means so as to maintain the temperatures at selected levels in said stack within predetermined temperature ranges; and

(10) Heat exchanger/de-moisturizer means located in line between said conduit means connecting said suction tube means and said blower low pressure side for extracting heat and moisture from the air withdrawn from said stack.

4,466,202

ENERGY-EFFICIENT EVAPORATION PROCESS WITH MEANS FOR VAPOR RECOVERY

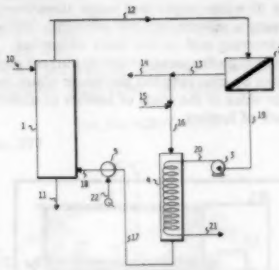
Ulrich Merten, Pittsburgh, Pa., assignor to Bend Research, Inc., Bend, Oreg.

Filed Mar. 7, 1983, Ser. No. 473,030

Int. Cl.³ F26B *3/06*

U.S. Cl. 34—27 **37 Claims**

1. An energy-efficient process for the recovery of latent heat from a drying process comprising (1) contacting a material containing a volatile liquid with a gaseous drying medium and supplying heat to said drying medium or to said material and thereby producing an exhaust mixture of noncondensable gas and condensable vapor, (2) separating the condensable vapor in said exhaust mixture by passing it through a nonporous nonionic polymeric membrane which is substantially permeable to said condensable vapor and substantially impermeable to said noncondensable gas, (3) transferring said separated condensable vapor, together with the latent heat of condensation contained therein, to a compressor, (4) compressing in said compressor said separated condensable vapor, and (5) condensing said separated condensable vapor by heat exchange,



thereby recovering the latent heat of condensation of said separated condensable vapor.

4,466,203

STAND FOR A HAND HELD HAIR DRYER

Charles H. Thomas, 4036 Point Church, Memphis, Tenn. 38127

Filed Apr. 10, 1981, Ser. No. 253,032

Int. Cl.³ A45D *21/00*

U.S. Cl. 34—99 **1 Claim**

1. A stand for attaching a standard hand held hair drying unit to the back of a chair, said stand comprising:

(a) first clamp means for being secured to the back of the chair, said first clamp means including a first C-clamp member for being secured to the back of the chair and including a second C-clamp member for being secured to the back of the chair;

(b) a stabilizer bar having a first end attached to said first C-clamp member and having a second end attached to said second C-clamp member;

(c) neck means having a lower end for being attached to said first clamp means and having an upper end, said neck means including a sleeve member having a first end fixedly attached to said stabilizer bar and having a second end, said neck means including a slide member having a first end for being slidably received within said second end of said sleeve member and having a second end;

(d) second clamp means for being attached to said second end of said slide member of said neck means and for being secured to the hair drying unit;

(e) a bonnet means for placement over the hair of a person sitting on the chair; and

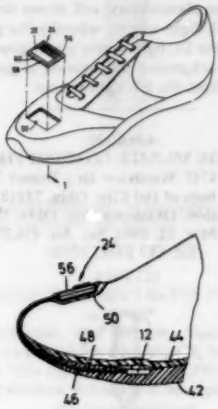
(f) a flexible hose means having a first end for being attached to said bonnet means and having a second end for being removably attached to the hair drying unit for distributing hot air from the hair drying unit to said bonnet means.

4,466,204

ELECTRONIC PACE AND DISTANCE COUNTING SHOE

Chyuan-Jong Wu, No. 15, Lane 41, Ta-Tung Rd., Fei-Sha Tsun, Su-Hu Hsiang, Yun-Lin Hsien, Taiwan

Continuation-in-part of Ser. No. 267,630, May 27, 1981, Pat. No. 4,402,147. This application Sep. 27, 1982, Ser. No. 424,102
Int. Cl.³ A43B 5/00, 23/00; G01C 22/00
U.S. Cl. 36—132 7 Claims



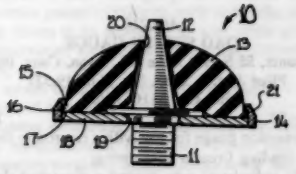
1. Apparatus adapted for disposition on a shoe, comprising:
a switch device, disposed proximate to the toe of said shoe, for generating a pace signal in response to each pace by said shoe;
an electronic device removably fixed in the toe of said shoe, removably connected to said switch device, and responsive to said pace signals, said electronic device comprising: means, responsive to said pace signals, for generating a pace count signal indicative of the number of paces;
a display device, viewably disposed on the top of said shoe, and responsive to input signals applied thereto, for providing indicia of said input signals; and
means for selectively applying said pace count signal to said display device as said input signal.

4,466,205

SAFETY STUD

George V. Corbari, 254 Cecil Place, Costa Mesa, Calif. 92627

Filed Jan. 10, 1983, Ser. No. 456,609
Int. Cl.³ A43C 15/02, 15/16
U.S. Cl. 36—134 6 Claims



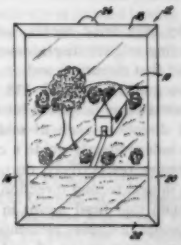
1. A cleat for use in sports shoes comprising:
a tapped bore substantially normal to said sole;
a plurality of cleats that are operatively associated with said plugs, each cleat including;
an external threaded boss means that extends upward from said cleat and is designed to engage said tapped bore;
a rigid tapered spike means that extends from said cleat in a direction opposite said boss means, with a horizontal end portion;
a domed body means of resilient material, but collapses when the individual walks on a soft surface, with a central hole through which the end of the spike protrudes;
a rigid flange means of substantially greater transverse cross section than that of the plug that has a central opening that fits on said boss holding the domed body in place;
a ring means encircling said flange and domed body trapping the bottom portion of the domed body against the flange means and holding the flange means in place against the domed body and an inward bent lip on top of the ring; and,
a disc means, with a central hole for accomodation of the threaded boss means said disc means is forceably fit into the bottom of the ring means placing the ring in tention, holding the ring, rigid flange, domed body and sports stud in permanent combination.

4,466,206

PICTURE FRAME

Roy N. Meadows, 900 Hearthside, South Lyon, Mich. 48178

Filed Sep. 8, 1982, Ser. No. 415,815
Int. Cl.³ G09F 1/12
U.S. Cl. 40—152.1 5 Claims



1. A picture frame for displaying a graphic comprising a plurality of interconnected marginal frame members, a substantially flat, transparent window affixed between said marginal frame members, a substantially flat closure back panel holding said graphic against said transparent window when said closure back panel is in a closed position, a latch member attached to one of said frame members and having a protruding portion retaining said closure back panel in said closed position, and a recess in said latch member for mounting said picture frame directly on a hanging post protruding from an adjacent wall, wherein said latch member is pivotably attached to said one of said frame members and is rotatable from a first position whereby said protruding portion retains said closure back panel in said closed position to a second position whereby said protruding portion frees said closure back panel and wherein said recess in said latch member is provided with converging sidewalls which guide a projecting end of said hanging post protruding from said adjacent wall to a predetermined position within said recess.

4,466,207

INFORMATION DISPLAY DEVICES

Hassan P. A. Salam, London, England, assignor to Unisplay S.A., Geneva, Switzerland

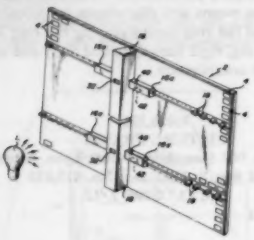
Filed Nov. 12, 1981, Ser. No. 320,480
Int. Cl.³ G09F 9/00
U.S. Cl. 40—449 17 Claims

1. A display device, comprising
(a) a matrix panel (2, 102, 202, 302) containing a plurality of display elements (4, 104, 204, 304) arranged in horizontal and vertical rows to define said matrix, each of said display elements having first and second contrasting states;

(b) at least two actuating head means (**16, 116, 216, 316**) arranged adjacent one side of said panel for controlling corresponding groups of said display elements, respectively, said groups being arranged relative to each other in a first direction corresponding with one of said horizontal and vertical rows of said matrix, each of said head means being further operable to individually selectively control the state of each element of its corresponding said group;

(c) drive means (**26**) for displacing said head means relative to said panel in a second direction normal to said first direction;

(d) resilient means (**28**) for coupling said head means with said drive means, whereby said head means are displaced



in unison by said drive means, said resilient coupling means affording relative displacement between said head means in said first direction; and

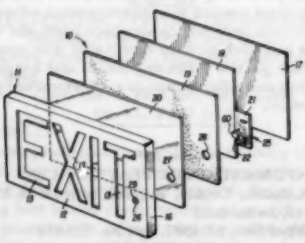
(e) at least two guide means (**18, 118, 218, 318**) connected with said matrix panel in spaced relation and extending in said second direction, each of said guide means being operable to independently guide a corresponding one of said head means, respectively, during movement of said head means in said second direction, whereby said guide means maintain said head means in alignment with said respective groups of display elements arranged in said first direction during movement of said head means in said second direction.

4,466,208

EMERGENCY EXIT SIGN UTILIZING AN ELECTRO-LUMINESCENT (EL) LAMP AND A BRIGHTNESS MONITOR

Emanuel L. Logan, Jr., 2301 Jeff. Davis Hwy., Apt. 1024, Arlington, Va. 22202, and J. William Walsh, 3823 Beech Ave., Baltimore, Md. 21211

Filed Jul. 30, 1982, Ser. No. 404,391
Int. Cl.³ G09F *13/22*
U.S. Cl. 40—544 **7 Claims**



1. An emergency exit sign comprising:

an EL light source; wherein the DL light source incldes a layer of phosphorous encapsulated between a layer of glass and a steel substrate;

means for energizing the EL light source;

means for configuring the light emitted by the EL light source into a message meaning "exit";

photoelectric cell means disposed adjacent the EL light source for monitoring the intensity of the illumination emitted by the EL light source;

a pilot ligh for indicating that the EL light source is illuminating, and

means for connecting the photoelectric cell means to the pilot light for allowing current to flow to the pilot light only when the photoelectric cell means detects illumination of the EL light source, whereby the pilot light will indicate that the EL light source is energized and working even when background illumination is greater than the illumination from the EL light source.

4,466,209

LOADER FOR MUZZLE-LOADING FIREARMS

Leon Strickland, 4745 Woodview Dr.; Robert M. Foglesong, 3115 Del View, both of Del City, Okla. 73115, and Terry D. Arden, 5009 Lanlow, Oklahoma City, Okla. 73135

Filed Mar. 11, 1983, Ser. No. 474,373
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **7 Claims**

1. A muzzle-loading device for carrying materials for muzzle-loading firearms, comprising:

an elongated shaft having an elongated powder sleeve axially projecting from one end for holding a gunpowder charge;

a first cap closing the end of said sleeve opposite the shaft;

projectile chamber means including a projectile surrounding sleeve axially projecting beyond the other end portion of said shaft for telescoping movement of said shaft through the projectile sleeve; and,

a second cap closing the end of the projectile sleeve opposite said shaft.

4,466,210

LOAD SETTER GAUGE

Regis A. Koontz, 55 Secret Lake Rd., Avon, Conn. 06001

Filed Aug. 1, 1983, Ser. No. 519,321
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **14 Claims**

1. A compression gauge for use with a ramrod in the loading of a muzzle-loading firearm comprising:

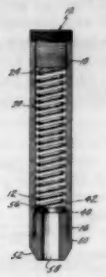
a generally cylindrical tube having a diametral slot and an indicia means exteriorly adjacent said slot;

a coiled spring received in said tube and generally axially compressible therein;

a seating means at one end of said tube to seat one end of said coiled spring;

an indicator means positioned relative to the coiled spring and alignable relative to the indicia means to indicate the axial compression of the coiled spring; and

an engagement member positioned against the other end of the coiled spring and engageable with an end of a ramrod



so that axial compression of the spring is indicative of an axial force applied to the ramrod.

4,466,211

STRIKE SIGNALLING APPARATUS FOR A FISHING ROD

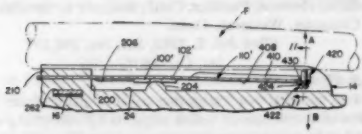
William R. Mathauser, 3000 "B" Ave., Anacortes, Wash. 98221

Continuation-in-part of Ser. No. 266,979, May 26, 1981, Pat. No. 4,448,489. This application Oct. 28, 1981, Ser. No. 315,724

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.³ A01K *97/12*

U.S. Cl. 43—17 **7 Claims**



1. A device for use in fishing comprising:

self-contained means mountable on different fishing rods of various types and sizes for signalling when a fish has struck including as follows;

a housing detachably mounted on a fishing rod at a selected position;

attaching means detachably mounting said housing on the fishing rod;

fishing rod deflection monitoring means directly mounted on said housing and including a strain gauge and means contacting the fishing rod and transferring fishing rod deflection to said strain gauge in a manner which causes said strain gauge to react to such rod deflection;

alerting means to be activated by said strain gauge when a predetermined amount of fishing rod deflection has occured;

circuit means connecting said altering means to said strain gauge and to a power source;

said housing protecting said deflection monitoring means from environmental conditions which may cause said monitoring means to inconsistently sense rod flexure;

said rod contacting means including an elongate mounting plate having setting means for accommodating fishing rods of various diameters;

said setting means including a set screw threadably received in a threaded hole defined in said mounting plate, a collar circumambient said threaded hole, and retaining means in said collar, said retaining means including non-hardening material positioned in the collar for retaining the set screw in position.

4,466,212

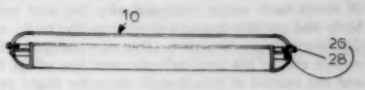
INFLATABLE SAUCER TOY WITH SHAPE HOLDERS AND WEIGHTS

James A. Lehman, 362 N. Seymour St. (Apt. 218), Fond du Lac, Wis. 54935

Filed Aug. 2, 1982, Ser. No. 404,214

Int. Cl.³ A63H *27/00*

U.S. Cl. 446—46 **8 Claims**



1. An improved inflatable flying saucer toy comprising: two sections joined at their peripheries by a male and female joining means; one of said two sections having a central dome portion and a first peripheral depending lip forming a generally concave and convex structure, said first peripheral depending lip having one of said male and female joining means formed thereon; the other of said two sections having a central dome portion and a second peripheral depending lip forming a generally concave and convex structure, said second peripheral depending lip including a reversed portion and having the other of said male and female joining means formed thereon, whereby when said two sections are joined by said joining means an unitary saucer toy is formed having an inflatable gas tight chamber between said two sections and when said chamber is inflated through an air filling means on said unitary saucer toy and the unitary saucer toy is held relatively rigid by a shape holding means, the unitary saucer toy 6 can be thrown through the air for a substantially long distance.

4,466,213

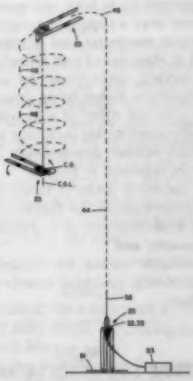
AERIAL FLIGHT DEVICE

Dominec Alberico, 1103 Garfield St., Lockport, Ill. 60441, and Jack A. Albert, 323 Pasadena Ave., Crest Hill, Ill. 60435

Filed Jun. 17, 1983, Ser. No. 505,284

Int. Cl.³ A63H *27/00, 27/14*

U.S. Cl. 446—56 **13 Claims**



1. A toylike symmetrically formed aerial flight device comprising a body, a head projecting forwardly from the body, a pair of sweptback wings projecting rearwardly from the body, and a pair of discrete weight segments fixed to the flight device with each weight segment having a density greater than that of the remaining portions of the flight device providing aerodynamic surfaces and with each segment being effective in diagonally opposite quadrants defined by the longitudinal center line of the flight device and a lateral line normal to the longitudinal center line with the point of origin of the intersecting lines

being located approximately at the center of gravity of the flight device.

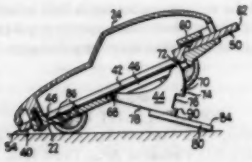
6. A toylike aerial flight device having a simulated rocket configuration comprising a body formed with a bore longitudinally thereof serving as a socket, a solid fuel propellant cartridge having a thrust charge and a retro-fire charge in said socket, a cone-shaped head projecting forwardly from the body and being hinged and latched to the body, said head when latched closing the forward end of said bore, has a pair of swept-back wings symmetrically disposed relative to the body and projecting rearwardly from the body, and a pair of discrete weight segments the first of which is fixed to the head on one side of the longitudinal center line of the flight device and the second of which is fixed to the flight device on the other side of the longitudinal center line to the rear of the first weight and in which ignition of the thrust charge launches the flight device, and in which the subsequent ignition of the retro-fire charge unlatches the entire head to tilt it as a single unit to a hinged position farther removed laterally from the longitudinal center line to promote gyrating flight.

4,466,214

IMPACT RESPONSIVE TOY VEHICLE

Ralph J. Kulesza, Chicago, and Harry Disko, S. Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sep. 22, 1982, Ser. No. 421,372
Int. Cl.³ A63H *17/26*
U.S. Cl. 446—437 **7 Claims**



1. A toy vehicle comprising:

a housing supported on at least two spaced wheels for rolling movement over a supporting surface;

impact responsive means on said housing for pivoting said housing and at least one of said wheels with respect to the supporting surface, upon impact by said housing;

said impact responsive means being arranged to pivot one of said wheels over the other of said wheels;

said impact responsive means including a pivotally mounted member which extends downwardly from the interior of said vehicle in response to impact;

said pivotally mounted member contacting the supporting surface at a point beneath the rearward end of said vehicle so that said vehicle pivots in a generally rear end-over-front end manner; and

manually presettable means for controlling the point at which the pivotally mounted member contacts the supporting surface.

4,466,215

MINIATURE TOY VEHICLE ASSEMBLY

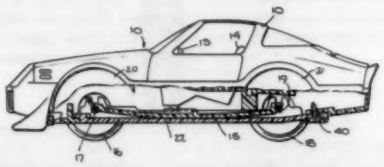
Hiroshi Hanazato, Tokyo, Japan, assignor to Buddy L Corporation, New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,255
Int. Cl.³ A63H *17/26*
U.S. Cl. 446—469 **9 Claims**

1. A miniature toy vehicle comprising:

(A) a body formed into a small-scale replica of a given high-performance vehicle, said body having in its underside a rectangular well;

(B) a standardized sub-assembly on which said body is adapted to rest regardless of its form, said sub-assembly including a rectangular chassis dimensioned to fit into said well and having front and rear slotted side bearings, front and rear axled wheel sets whose axles drop into the slots of the respective side bearings, and a flexible latching strip to retain said axles in said bearings, said strip having a constricted neck dividing the strip into a short head section and a longer tail section, the head section terminating in a raised step from which projects an upwardly inclined prow, said tail section terminating in a raised step, the bed



of said chassis having a pair of parallel rails thereon to form a longitudinal guide for the strip, said rails having upper flanges to define a narrowed inlet to receive said neck and to place said strip on said bed at an initial position at which the head section is displaced inwardly from the front axle and the tail section overlies the rear axle, which strip when pushed forward toward a latching position causing the prow to ride over the front axle to lift the head section to permit the front step to engage the front axle, at which point the rear step engages the rear axle.

4,466,216

METHOD FOR PROPAGATING PLANTS FROM TISSUE CULTURES

John A. Howard, Pacifica, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 8, 1982, Ser. No. 396,197
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 **4 Claims**

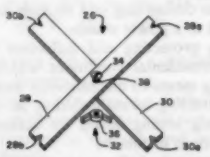
1. A method of propagating tobacco plants from tissue cultures of cotyledon or callus explants by subjecting said tissue culture to propagation enhancement conditions in the presence of an appropriate nutrient medium, in which the propagation is conducted in the presence of from about 0.5 to about 2.0% by volume of carbon dioxide in the atmosphere, and, if the propagation is carried out in the absence of light, the nutrient medium contains 1% of a carbohydrate carbon source.

4,466,217

TECHNIQUE FOR AIDING IN INSERTING A PLANT POT INTO AND REMOVING IT FROM A PLANT HANGER

Stephen C. Shear, 1726 Wright Ave., Sunnyvale, Calif. 94087

Filed Sep. 29, 1982, Ser. No. 426,942
Int. Cl.³ A01G *13/00*
U.S. Cl. 47—58 **6 Claims**



1. A method of removing a hanging plant pot from a support hanger having a plurality of cords extending from a common top to a bottom base section, said method comprising:

(a) mechanically maintaining said cords in positions which

are displaced from their normal hanging positions when the pot is supported thereby so as to provide a plurality of spaces between certain ones of said cords, each of said spaces being wider than the space between its adjacent cords when the latter are in said normal pot hanging positions; and

(b) providing a mechanical apparatus including a pair of first and second elongated members interconnected in a pivotal manner at their centers such that said members are positionable prependicular to one another and parallel to one another, said mechanical apparatus with its elongated members maintained perpendicular to one another being used to mechanically maintain said cords in positions which are displaced from their normal hanging positions by engaging opposite ends of one of said members against predetermined ones of said cords and the opposite ends of the other member against other predetermined cords;

(c) while said cords are maintained in said displaced positions, manually moving said planted pot out of said hanger through one of the said spaces.

4,466,218

FIXED ABRASIVE POLISHING MEDIA

John C. Ottman, San Jose, Calif., and John C. S. Shen, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 260,549, May 4, 1981, Pat. No. 4,393,628. This application Apr. 22, 1983, Ser. No. 474,864

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—395 **6 Claims**

1. A non-friable, fixed abrasive polishing pad comprising:

50 to 70% by weight of classified hard particles not exceeding 5 microns in size which have been treated with a silicon surfactant and are retained in a binder of polyurethane foam formed in a closed mold to produce a part having a hardness of 30 to 60 durometer, D-scale.

4,466,219

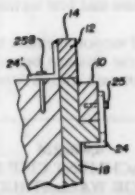
ADJUSTABLE MANHOLE COVER

James J. Campolito, 3203 White Beach La., Youngstown, Ohio 44511

Continuation-in-part of Ser. No. 336,874, Jan. 4, 1982,. This application May 18, 1983, Ser. No. 495,652

Int. Cl.³ E02D *29/14*

U.S. Cl. 52—20 **3 Claims**



1. An adjustable manhole cover support ring assembly for adjusting the elevation of a manhole cover with respect to a manhole frame in a roadway having an inner annular ledge and an upper annular edge thereabout and comprising at least a pair of split rings, a first one of which is arranged to be positioned on said inner annular ledge and a second one of which is arranged to be positioned on said upper annular edge and around said first ring so as to define an area on said first ring and within said second ring for the reception of said manhole cover, adjustable means for securing said rings to said manhole frame consisting of a plurality of L-shaped clips, each having an elongated slot in one portion thereof and fasteners in said slots engaging said annular rings.

4,466,220

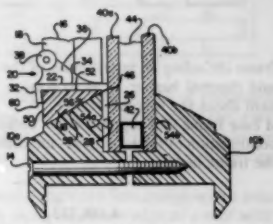
GRILL INSERT CLIP

Bernd Lewkowitz, 306 N. Gladstone Ave., Margate, N.J. 08402

Filed Jun. 25, 1981, Ser. No. 277,284

Int. Cl.³ E06B *3/30*

U.S. Cl. 52—127.6 **9 Claims**



1. In a construction to attach a decorative grill having a peripheral border to a framed window insert of the type including at least one pane of glass and a peripheral frame overfitting a peripheral portion of the pane of glass to retain the glass the improvement comprising

a clip having a generally channel-shaped, plastic body of configuration to overfit the peripheral border part of the grill, the body comprising

a web having first and second ends, an attaching leg extending at right angles from the first end of the web and being adapted to insert between the frame and the peripheral portion of the glass to secure the body to the frame,

the attaching leg directly contacting the frame and not contacting the grill, and

a grill leg extending from the second end of the web, the grill leg being in contact with the peripheral border part of the grill tc attach the grill to the frame,

the web, the attaching leg and the grill leg defining a body having a closed top and an open bottom; and

means connected to the body to temporarily move the clip web relative to the attaching leg to vary the angle between the web and the attaching leg sufficiently to permit a portion of the grill border to position between the frame and the grill leg for attachment and removal of the decorative grill to and from the insert.

4,466,221

THERMAL BARRIER SKYLIGHT

Paul A. Couture, Emery Mills, Me., assignor to Wasco Products, Inc., Sanford, Me.

Filed Oct. 9, 1981, Ser. No. 309,933

Int. Cl.³ E04B *7/18*

U.S. Cl. 52—200 **17 Claims**

1. A skylight construction for an opening in a building or the like comprising;

a frame means extending about the opening and including means secureable about the opening,

translucent or transparent means covering the opening and extending at edges to overlie the frame means,

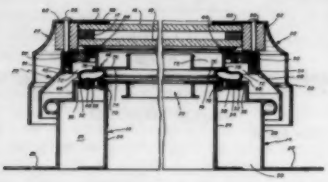
means for retaining the covering means on the frame means,

said frame means comprising a base frame and a support frame overlying the base frame,

said support frame having inner and outer sections connected by a heat insulating thermal barrier,

each said section including multiple pieces joined at corners of the support frame,

means providing welding at said corners of the support



frame including an interruption of the weld in the area of said thermal barrier so as to form a self-draining liquid path about the thermal barrier

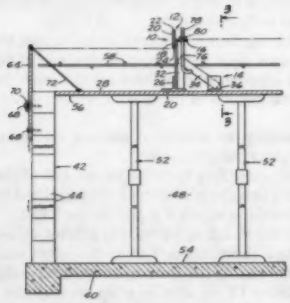
said base frame and support frame defining therebetween a continuation of the liquid path unobstructed to external of the frame means.

4,466,222

DEPRESSION RAIL AND WATER STOP FOR CONCRETE BUILDING SLABS

George D. Mitchell, 1012 Wiladona Dr., La Canada, Calif. 91011

Filed Dec. 31, 1981, Ser. No. 336,059
Int. Cl.³ E04F *13/06*
U.S. Cl. 52—371 **4 Claims**



1. A consumable construction level form and water stop combination for use in laying a concrete slab upon a base wherein the concrete slab has a depressed area below the top surface of said slab, said combination including:

a depression rail and water stop means mounted on said base, said means including a plurality of base support members and a rail water stop extending therebetween and supported thereon and spaced above said base and said base support members and said rail water stop being formed of material each possessing the same cross sectional configuration;

said rail water stop including a first edge horizontal portion that serves as a guide for limiting the height of said top surface of said concrete slab and a second horizontal edge portion spaced vertically below said first edge portion which serves as a guide for limiting the height of said depressed area of said concrete slab;

said depression rail and water stop being of a cross sectional configuration to act as a water stop to prevent moisture on said depressed area from moving onto said top surface of said slab when said depression rail and water stop are fixed in said slab;

each of said base support members include first and second base supports mounted on said base;

a vertical support rising from said first base support;

a strut extending from said second base support to and engaging said vertical support to stabilize said rail and water stop;

said material forming said depression rail and water stop and the pieces of said base supports are T-shaped in cross section and each includes a top portion and a leg extending normal thereto; and

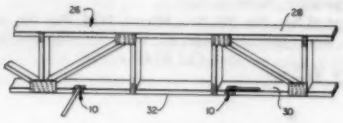
said rail and water stop are mounted with the top of said T in a vertical position and the leg of said T extends in a horizontal position inwardly away from said depressed area.

4,466,223

INSULATION SUPPORT CLIP

Joaquin J. Palacio, and Carlos C. Cristobal, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Filed Jan. 7, 1983, Ser. No. 456,341
Int. Cl.³ E04B *1/74*
U.S. Cl. 52—404 **1 Claim**



1. A truss assembly comprising:

(a) upper and lower wooden members interconnected to from a truss having a longitudinal axis and a height orthogonal to the longitudinal axis, said lower wooden member being parallel to the longitudinal axis of the truss and having side faces parallel to the height of said truss;

(b) a plurality of insulation retaining clips for supporting insulation from said truss, said clips being attached to the side faces of said lower wooden member at spaced apart locations along said lower wooden member for supporting insulating material between adjacent truss assemblies;

(c) each of said clips including a bracket having first and second sections joined together to from an approximately 90° angle, said first section having a plurality of teeth struck therefrom and projecting generally orthogonally from said first section in the same direction that said second section extends from said first section for embedment of said teeth in the side face of said lower wooden member at the spaced apart locations, said second section lying on the upper surface of said lower wooden member and an elongated support member rotatably attached to said second section, said support member being rotatable to a position extending in the same direction as said second section extends from said first section for supporting insulation; and,

(d) the length of said support member being equal to approximately one-half the distance between adjacent truss assemblies to which said clip is attached for supporting insulation.

4,466,224

TWO-PIECE ATTACHMENT CLIP FOR INSULATED ROOF OR WALL STRUCTURE

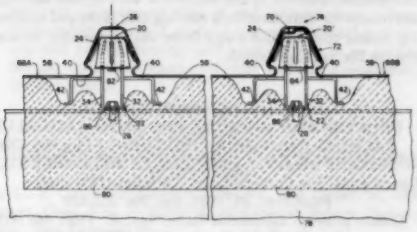
James G. Hague, Mars, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jun. 18, 1982, Ser. No. 389,845
Int. Cl.³ E04D *3/362, 3/38*
U.S. Cl. 52—478 **10 Claims**

1. An insulated roof or wall structure having horizontally extending, spaced-apart structural elements; compressible insu-

lation spanning transversely across said structural elements; plural panel members overlying said insulation, spanning transversely across said structural elements, and being erected in side-by-side relation, said panel members presenting alternating panel webs and upstanding, downwardly opening longitudinal ribs each presenting an entrance opening and spaced-apart latching shoulders on opposite sides of said opening; and two-piece clip assemblies securing said ribs to said structural elements; each of said clip assemblies including:

a U-shaped base clip including a bottom wall secured to the subjacent structural element and fully compressing the



underlying insulation, upstanding sidewalls extending into an associated rib, and integral clip-stabilizing portions, one extending laterally outwardly from each of said sidewalls, each of said clip-stabilizing portions including a horizontal upper segment supporting an overlying panel web and a horizontal lower segment vertically spaced from the structural element and from said upper segment and partially compressing the underlying insulation; and

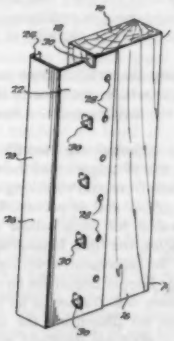
flexible connecting means carried at upper ends of said sidewalls and interengaged with the latching shoulders of an associated rib connecting the associated rib to the structural element.

4,466,225

STUD EXTENDERS

John K. Hovind, Clarence, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Dec. 3, 1981, Ser. No. 327,215
Int. Cl.³ E04C *3/30*
U.S. Cl. 52—730 **8 Claims**



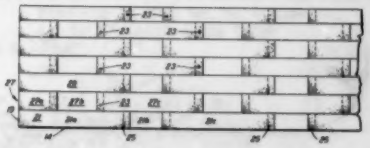
1. A formed sheet metal stud extender consisting solely of a first wide flat side, a second side which is substantially parallel and spaced from said first wide flat side, and a flat front, free of any elements frontward thereof, said flat front being perpendicular to and adjoining said two sides at substantially square corners, all formed solely of sheet metal, said at least one wide flat side having means for locating said stud extender against a wood stud with the front of said extender in a uniform spaced parallel relationship to the front of said wood stud when said wide flat side is disposed against and extending across a minor extent of the side of said wood stud.

4,466,226

METHODS OF APPLYING ROOFING SHINGLES

Nicholas J. Rohner, Delhi, N.Y. 13753

Filed Nov. 18, 1982, Ser. No. 442,597
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—748 **8 Claims**



1. A method of applying solid roof singles of rectangular shape to the roof of a structure, each shingle having two minor edges and two major edges and an upper portion to be located remotely from the lower edge of the roof, said method comprising:

placing a first solid roof shingle in a first course with a major edge of the shingle along the lower edge of a roof with a minor edge of the shingle abutting a side edge of the roof;

placing a third solid roof shingle in the first course along the lower edge of the roof aligned with the first shingle, said third solid roof shingle being of full length, the first shingle and the third shingle being spaced from one another a distance of substantially one-third the length of a shingle of full length;

placing a second solid roof shingle in the first course along the lower edge of the roof aligned with both the first shingle and the third shingle, said second solid roof shingle having a length of substantially one-half the length of a shingle of full length, an overlap being formed between said first shingle and said second shingle and another overlap being formed between said third shingle and said second shingle, both of said overlaps being substantially equal;

inserting a nail through the overlap of the first and second shingles and a nail through the overlap of the second and third shingles, each nail being inserted in the upper portion of the shingles remote from the lower edge of the roof;

placing a first solid roof shingle in a second course overlapping the upper portion of the first course, said first solid shingle in the second course abutting the same side edge of the roof as the first shingle of the first course;

placing a third solid roof shingle in the second course overlapping the upper portion of the first course and aligned with the first shingle of the second course, said third solid roof shingle of the second course being of full length, the first shingle and the third shingle of the second course being spaced from one another a distance of substantially one-third the length of a shingle of full length;

placing a second solid roof shingle in the second course overlapping the upper portion of the first course aligned with both the first and the third shingle of the second course, said second solid roof shingle having a length of substantially one-half the length of a shingle of full length, an overlap being formed between said first shingle and said second shingle and another overlap being formed between said third shingle and said second shingle, both of said overlaps being substantially equal; and

inserting a nail through the overlap of the first and second shingle of the second course and a nail through the overlap of the second and third shingles of the second course,

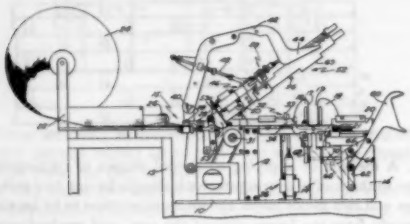
each nail being inserted in the upper portion of the shingles remote from the lower edge of the roof.

4,466,227

MACHINE FOR WRAPPING TAPE ABOUT AN ARTICLE

John F. Hanscom, Rehoboth, Mass., assignor to H. F. Hanscom & Company, Inc., Providence, R.I.

Filed Dec. 24, 1981, Ser. No. 334,459
Int. Cl.³ B65B 63/02
U.S. Cl. 53—528 5 Claims



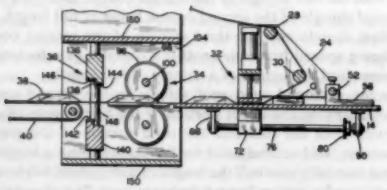
1. A bander for wrapping tape about an article comprising
(a) a supply of tape;
(b) a pair of spaced stationary jaws between which the article to be banded is received, said jaws having opposed faces;
(c) a tape feed platform adjacent one jaw;
(d) means feeding tape from said supply and platform normal to the faces of said jaws so as to lie beneath a location for the article between the jaws;
(e) folding bars reciprocating in said jaws for engaging tape and moving the tape upwardly on opposite sides of the article;
(f) a pincher block pivotally mounted on an axis perpendicular to the feeding direction of the tape, the pincher block including a face, means pivoting said block from an up position to a position wherein the face rests on the article;
(g) pincher jaw means mounted on said block, said pincher jaw means operating substantially normal to the faces of said spaced jaws and engaging the upstanding end portions of the tape to press the end portions together and about the upper portion of the article.

4,466,228

METHOD AND APPARATUS FOR PRODUCING PACKAGES FROM COHESIVE-COATED MEDIA

Larry C. Gess, Temperance, Mich., assignor to L. C. Gess, Inc., Toledo, Ohio

Filed Nov. 12, 1981, Ser. No. 320,662
Int. Cl.³ B65B 9/02
U.S. Cl. 53—553 3 Claims



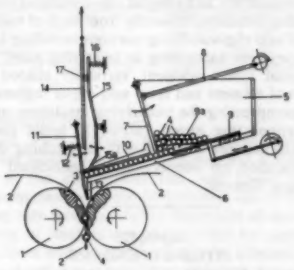
1. Apparatus for making a package containing an object from two strips of material having cohesive coatings thereon, said apparatus comprising means forming a supporting surface for supporting a lower strip of the material with the cohesive coating facing upwardly, means for placing an object on the lower strip, means for positioning an upper strip of the material with the cohesive coating facing downwardly over the object and over the lower strip with the longitudinal edges of both strips being substantially parallel, means for pressing together the strips along a transverse area in front of the object and then in back of the object, supporting posts spaced apart beyond side edges of said strips for supporting said pressing means, means for pressing together the strips along parallel, longitudinal areas on each side of the object after the transverse area of the strips in front of the object is pressed, means for subsequently separating a leading portion of the strips containing the object from a trailing portion by severing the strips along an intermediate portion of the transverse area behind the object, and means for simultaneously moving said posts and said pressing means toward and away from said separating means to change the package length.

4,466,229

PROCESS AND MACHINE FOR AUTOMATICALLY PACKING INDIVIDUAL DRINKING STRAWS, OR SIMILARLY SHAPED ARTICLES, IN WELDABLE FILMS

Donati Gino, Via Carpignola, 64, Cattolica (FO), Italy

Filed Nov. 18, 1981, Ser. No. 322,429
Claims priority, application Italy, Nov. 27, 1980, 648 A/80
Int. Cl.³ B65B 13/04, 27/10; B65H 9/08
U.S. Cl. 53—559 11 Claims



1. A device for packing a plurality of elongate articles of uniform shape between two films of packaging material such that the distance between adjacent articles when packaged is constant and the two films between said adjacent articles are laminated together comprising in combination:
a storage hopper containing a plurality of the articles to be packaged,
means for dispensing the articles from said hopper in an array such that the articles are linearly aligned in a series,
means for feeding the articles one at a time from the series for packaging,
a packaging means including the two films which receive each article at a site of tangency of the two films,
whereby downstream from said receiving site the two films are laminated together and an accomodation pocket will have been provided for each article equispaced from adjacent fed articles, the films laminated providing equispaced intervals for subsequent severing;
wherein said storage hopper comprises an open top receptacle having a bottom wall formed as an inclined plane;
wherein said means for dispensing the articles from said hopper include a platform disposed within the hopper provided with means for oscillating said platform, said platform spaced from and parallel with said inclined bottom wall and said oscillating means moves said platform in an oscillatory motion parallel to said inclined bottom wall;
wherein said platform includes a raised front edge which encourages the articles to accumulate at a lowermost portion of the hopper;
wherein said hopper and said means for dispensing the arti-

cles include a wall under which the articles pass, said wall provided with a hinge at its topmost portion and a connecting rod extending from said wall to a means for oscillating said wall in an arcuate manner about said hinge so as to encourage one article to be dispensed at a time;

wherein said means for dispensing further includes at least one longitudinal arm overlying the articles having been dispensed from said hopper, said articles disposed on a continuation of said bottom wall defining a chute, said longitudinal arm constraining the articles to remain in an array linearly aligned in a series; and

wherein said feeding means includes a stopping rod disposed adjacent a lowermost edge of said inclined plane, a hinge transversely disposed along a top edge of said stopping rod and means pivoting said stopping rod in an arcuate fashion about said hinge to thereby provide a passageway for the articles.

4,466,230

AUTOMATIC FAN SPEED ADJUSTER FOR COMBINE HARVESTER

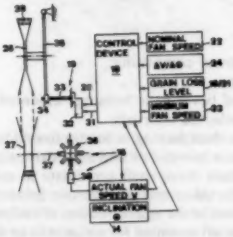
Guy H. J. Osselaere, Loppem-Zedelgem, and Daniël M. Danhieux, Gent, both of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed May 12, 1982, Ser. No. 377,534

Claims priority, application United Kingdom, May 20, 1981, 8115419

Int. Cl.³ A01F *12/48*; A01D *41/00*

U.S. Cl. 56—10.2 **8 Claims**



1. A combine harvester comprising threshing and separating means, sieve means to which crop material separated by the threshing and separating means passes, cleaning means having fan means operable to blow air through the sieve means and hence clean the crop material on the sieve means, the fan means being driven by variable speed drive means, sensor means operable to sense the fore-and-aft inclination of the machine and produce a signal representative thereof, means for selecting a nominal rotational speed for the fan means during operation of the machine on level ground as a function of harvesting conditions and producing a signal representative of the nominal speed, means for combining the inclination signal and the nominal speed signal to produce a signal representative of the desired speed of the fan means as a function of the fore-and-aft inclination of the machine, means for measuring the actual rotational speed of the fan means, means for establishing a selected relationship between the fore-and-aft inclination of the combine harvester and the rotational speed of the fan means and adjusting the signal from the sensor means accordingly, such that the adjusted signal is proportional to the desired fan speed as a function of the fore-and-aft inclination, said means for establishing said selected relationship being in the form of a double potentiometer having a pair of electrical resistances and a wiper arm associated with each resistance, each said electrical resistance being coupled in series with the sensor means operable to sense the fore-and-aft inclination of the machine therebetween, said wiper arms being mechanically coupled to each other for adjustment in unison in a manner such that, upon adjustment, the wiper arms both move in the same direction relative to the centrally disposed sensor means, and control means responsive to the desired fan speed signal and the actual fan speed signal to produce a command signal for application to the variable speed drive means, whereby the rotational speed of the fan means is adjusted as a function of the fore-and-aft inclination of the machine.

4,466,231

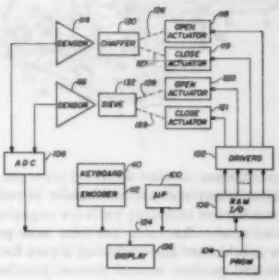
AUTOMATIC SIEVE AND CHAFFER ADJUSTMENT IN A COMBINE HARVESTER

E. William Rowland-Hill, and Ronald T. Sheehan, both of Lancaster, Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1982, Ser. No. 413,193

Int. Cl.³ A01D *45/00, 75/00*

U.S. Cl. 56—10.2 **11 Claims**



7. Apparatus for automatically setting a device on a combine harvester, said device being a sieve which is selectively settable at positions between a fully opened position and a fully closed position, said apparatus comprising:

sensor means for sensing the actual position of said sieve;

means generating a value representing a desired position of said sieve;

actuator means for driving said sieve;

means for comparing the actual position of said sieve with said desired position;

means responsive to said comparing means for applying first signals to said actuator means to drive said sieve to said fully opened position when said comparing means indicates that said desired position is less than said actual position;

means for detecting when said sieve has reached said fully opened position; and,

means responsive to said detecting means for terminating the first signals to said actuator means and applying to said actuator means second signals for driving said sieve to said desired position.

4,466,232

LAWNMOWER CONTROL ASSEMBLY

Anthony F. Beugelsdyk, and Michael A. Barnard, both of Wichita, Kans., assignors to Conchemco, Incorporated, Lenexa, Kans.

Filed Jan. 21, 1983, Ser. No. 459,823

Int. Cl.³ A01D *50/02*

U.S. Cl. 56—10.8 **6 Claims**

1. A control apparatus comprising:

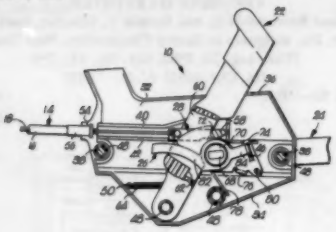
first handle means movable between a rest position and a shifted position;

second handle means swingable about a pivot pin between a released position and grasped position;

cable means shiftable between a first and second position, and having a cable end portion including structure engageable by said first handle means for shifting of said cable means from said first to said second position thereof;

means for biasing said cable means to said first position;

detent means independently rotatable about said pivot pin, said detent means being rotatable from a position corresponding to said released position of said second handle means wherein said first handle means is detained in said rest position by a portion of said detent means, to a position corresponding to said grasped position of said second handle means wherein said portion of the detent means clears said first handle means in spaced apart relationship thereto; and



retainer mechanism coupled with said pivot pin and shiftable thereabout when said second handle is swung, said retainer mechanism including parts for engaging said detent means to rotate the same between said positions, said retainer mechanism also including a part for holding

said cable end portion in said second position when said second handle means is retained in said grasped position, and for releasing said cable end portion when said second handle means is swung to said released position.

4,466,233

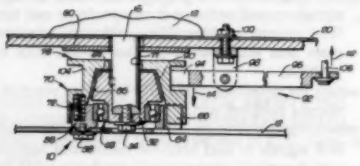
MOWER DRIVE ASSEMBLY

Dana F. Thesman, Torrance, Calif., assignor to Thesman Industries, Inc., Torrance, Calif.

Filed Sep. 30, 1982, Ser. No. 429,209

Int. Cl.³ A01D *69/08, 69/10;* **F16D** *67/02*

U.S. Cl. 56—11.3 **23 Claims**



1. A drive assembly for selective coupling of a rotary tool with a rotatable drive shaft projecting from an implement housing, comprising:

a drive shaft member secured generally to the end of the drive shaft and having a drive face presented generally toward the implement housing;

brake means on the implement housing for defining a brake surface presented generally toward said drive face;

a generally annular driven member for carrying the tool and having a set of relatively large, generally radially extending drive teeth;

bearing means for mounting said driven member generally about said drive member in an axially fixed position and for rotation relative thereto;

a clutch ring nondrivingly carried about the drive shaft and including a clutch face for frictional engagement with said drive face and a brake face for frictional engagement with said brake surface, said clutch ring being movable axially relative to the drive shaft between said brake means and said drive member and further including a generally axially extending set of relatively large drive teeth for meshing engagement with said set of driven member drive teeth for rotation of said clutch ring and driven member together throughout axial displacement of said clutch ring; and

actuator means for axially displacing said clutch ring between a driving position with said clutch face in frictional engagement with said drive face to rotatably drive said clutch ring and driven member and a braking position with said brake face in frictional engagement with said brake surface to halt rotation of said clutch ring and driven member.

4,466,234

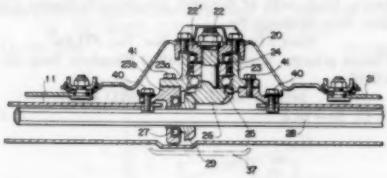
DISK MOWER

Chuichi Sasaki, Towada, Japan, assignor to Sasaki Nouki Kabushiki Kaisha, Towada, Japan

Filed Nov. 22, 1982, Ser. No. 443,451

Int. Cl.³ A01D *35/264, 55/262, 69/06*

U.S. Cl. 56—13.6 **7 Claims**



1. A disk mower comprising:

a cutter frame;

a plurality of bevel gear housings mounted on said cutter frame at selected intervals;

a main drive shaft having at least a four-sided cross-section and means at one end of said main drive shaft for supporting said main drive shaft proximate to said cutter frame wherein the other end of said main drive shaft is free and unobstructed in the axial direction of said main drive shaft;

a disk drive shaft mounted for rotation in an upper portion of each of said bevel gear housings and extending in a direction transverse to the axis of said main drive shaft;

a first bevel gear fixed at the lower end of said disk drive shaft;

a second bevel gear rotatably supported by a lower portion of each of said bevel gear housings, said second bevel gear engaging said first bevel gear and having an axial opening corresponding to said at least four-sided cross-section of said main drive shaft;

said main drive shaft being arranged to slidably pass through the openings of said second bevel gears for relative free sliding movement in the axial direction in response to deformation producing forces applied to one of said cutter frame, said disk drive shaft and said main drive shaft; and

a rotary disk having a cutter blade and mounted on said disk drive shaft for rotary cutting movement in response to rotation of said main drive shaft.

4,466,235

ROTARY MOWER

Denver C. Cole, Rte. 2, 108 Spring Creek Rd., Estill Springs, Tenn. 37330

Filed Jan. 10, 1983, Ser. No. 457,006

Int. Cl.³ A01D *35/26*

U.S. Cl. 56—16.9 **1 Claim**

1. A rotay mower comprising:

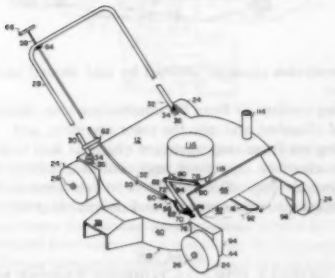
a gasoline-driven rotary power source and a drive shaft extending downward therefrom;

an elongated flat mowing blade attached to said shaft having a pair of oppositely tapering pointed prongs at each longi-

tudinal end of said blade, one prong of each said pair of prongs tapering upward at an angle of 15° to 35° with respect to the plane of said mowing blade, and the other prong of each said pair of prongs tapering downward at an angle of 15° to 35° with respect to the plane of said mowing blade, each said prong extending outward beyond its respective said longitudinal end of said mowing blade, and said blade having a portion of its bottommost edge beveled;

a housing having a top and side regions generally surrounding said mowing blade, said rotary power source being supported above said top of said housing approximately ½" to 1", and said housing having a first passageway therein underneath said power source, whereby a draft of air may move from under said engine downward through said passageway and under and out said housing around said mowing blade;

a plurality of wheels positioned and attached to said housing for movement of said housing along the ground in a line of direction;



a steering bar connected to said housing and extending away from said housing along a first direction along said line of direction;

said housing having an opening in one side and a portion of the adjoining top of said housing, said opening being on a side of said housing opposite to that of said steering bar;

a shield pivotally attached to said housing and configured to cover said opening;

control means, including a control cable assembly having a cable having one end coupled to said shield and an opposite end of said control cable assembly supported by said steering bar, for selectively opening and closing said shield over said opening and for maintaining said shield in either said open or said closed position; and

a portal in the top of said housing and an unobstructed circular tube extending around and up from said portal, said portal being located at a radial position with respect to said shaft corresponding to a radial position of said pointed prongs of said mowing blade.

4,466,236

THREAD-BREAK SENSOR FOR TEXTILE MACHINERY

Bernd Lagemann, Göppingen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

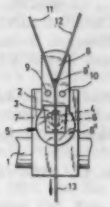
Filed Apr. 22, 1983, Ser. No. 487,588

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214996

Int. Cl.³ D01H *13/16*

U.S. Cl. 57—80 **12 Claims**

1. In a thread-break sensor comprising a stationary support, a carrier projecting from said support with a substantially horizontal axis, and a guide member on said carrier swingable about said axis, said guide member being provided with two pins on opposite sides of a plane of symmetry passing through a center of gravity of said guide member for engagement with respective threads merging under tension into a continuously advancing yarn at a junction below said pins, said guide member further having a contact surface normally resting on a coacting surface of said carrier in a metastable position in which said center of gravity is located above said surfaces, rupture of one of said threads causing the tension of the remaining thread to deflect said guide member laterally from said metastable position into an unstable position from which said guide member gravitates through substantially half a turn into a stable inverted position with resulting entanglement of said remaining thread with said pins and inhibition of further advancement thereof whereby said remaining thread is also ruptured,



the improvement wherein said carrier is provided with a plurality of angularly separated chordal ridges of different peripheral widths and is selectively orientable in a like plurality of different angular positions on said support in which respective ridges lie horizontally above said axis for coaction with said contact surface, thereby establishing a plurality of thresholds of instability for a difference in the tension of said threads sufficient to cause a swing of said guide member into said stable position thereof.

4,466,237

MIXED FIBER LENGTH YARN

Linda C. Sawyer, Morris, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 216,915, Dec. 16, 1980, Pat. No. 4,384,450, which is a continuation of Ser. No. 66,216, Aug. 13, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,990

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.³ D02G *3/04, 3/22*

U.S. Cl. 57—254 **21 Claims**

1. In a yarn comprised of a blend of synthetic fibers of different length, the improvment wherein the synthetic fibers present in the yarn comprise at least about 50 percent by weight of the fibers within said yarn and consist of a mixture of at least three groups of synthetic fibers, each group consisting of synthetic fibers of a substantially uniform length such that the fiber lengths within each group differ by a factor of 5 percent or less, and which differs from the substantially uniform length of the synthetic fibers in the other groups by a factor of at least about 15 percent, and wherein the synthetic fibers contained

within said at least three groups of synthetic fibers are distributed among each of the following ranges based upon the weight of the fibers present in said at least three groups:

(a) up to about 75 percent by weight of fibers having a length of about X, wherein X represents the length of the longest synthetic fiber in said groups;

(b) up to about 75 percent by weight of fibers having a length greater than about ½X up to but not including said length of about X; and

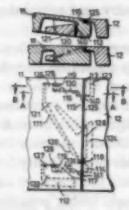
(c) up to about 35 percent by weight of fibers having a length less than or equal to said length of about ½X.

4,466,238

EXTENSIBLE LINK BAND

Bernhard Tesch, Ennetbürgen, Switzerland, assignor to Tesch A.G., Ennetbürgen and Zwyro A.G., Shaffhausen, both of, Switzerland

Continuation of Ser. No. 180,105, Aug. 21, 1980, abandoned.
This application May 31, 1983, Ser. No. 498,671
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 2934455
Int. Cl.³ F16G *13/00*
U.S. Cl. 59—82 **17 Claims**



1. A link band, in particular a watch band, a bracelet or the like comprising a plurality of links each defined by opposite longitudinal edges, opposite transverse edges and opposite upper and lower surfaces; means for forming an articulating connection between adjacent links with the longitudinal edges thereof in adjacent relationship, said articulating connection means each having an axis of rotation located contiguous adjacent longitudinal edges and upper surfaces of adjacent links, said articulating connection means being a first pair of projection means of one link received in a first pair of recess means of another link, means for absorbing forces normal to said longitudinal edges which forces are imparted to the link band when in use, said normal forces absorbing means being a second pair of projection means of said another link, extending transverse to and bridging across said axis of rotation and having abutment means received in second recess means of said one link at a position remote from said axis of rotation to thereby absorb the tensile forces normal to said longitudinal edges, and said abutment means being operative to absorb the normal forces when said adjacent links are in a common plane.

4,466,239

GAS TURBINE ENGINE WITH IMPROVED AIR COOLING CIRCUIT

Phillip D. Napoli, West Chester; Robert W. Harris, Fairfield, and Thomas A. Brisken, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

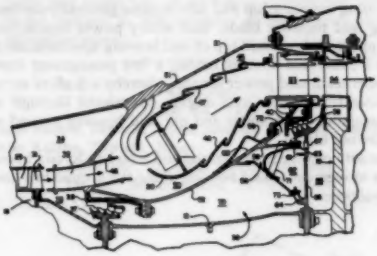
Filed Feb. 22, 1983, Ser. No. 468,216
Int. Cl.³ F02G *3/00*
U.S. Cl. 60—39.02 **13 Claims**

11. In a turbomachine having a rotor assembly, an annular combustor case concentrically positioned about the rotor assembly defining a cavity therebetween, a first seal between the rotor assembly and the combustor case for retarding air flow into the cavity, and a second seal between the rotor assembly and the combustor case for retarding air flow out of the cavity, the method of circulating coolant air from the combustor case into the rotor assembly comprising:

partitioning said cavity into:

an upstream chamber defined by said first seal and a third seal;

a central chamber defined by said third seal and a fourth seal; and



a downstream chamber defined by said second and fourth seals;

channeling coolant air from the combustion case, through said central chamber, and into the rotor assembly; and

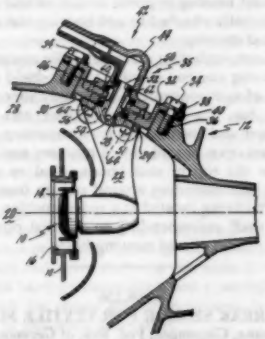
channeling air from said upstream chamber into said downstream chamber, bypassing said central chamber, thereby retarding air flow into and out from said central chamber with respect to said upstream and downstream chambers.

4,466,240

FUEL NOZZLE FOR GAS TURBINE ENGINE WITH EXTERNAL AND INTERNAL REMOVAL CAPABILITY

Guy W. Miller, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1981, Ser. No. 315,095
Int. Cl.³ F02C *7/22*
U.S. Cl. 60—39.31 **4 Claims**



1. A fuel nozzle attachment system for an annular combustor for a gas turbine engine including a generally conically shaped ring-like member having a plurality of spaced apertures each of which are adapted to receive at least one fuel nozzle, a plate retractably supported to said ring-like member having a main body portion spanning said aperture, a flange portion extending about the peripheral edge of said main body overlying said ring-like member about said aperture, securing means accessible from the exterior of said combustor retractably supporting said fuel nozzle in said combustor for permitting removal of said fuel nozzle externally of said combustor when said securing means are retracted, a fuel line having a passage communi-

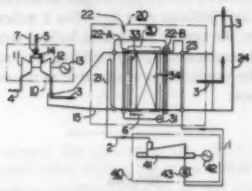
cating with said fuel nozzle for delivering fuel to said combustor, additional securing means accessible externally of said combustor for retractably securing said fuel nozzle to said main body portion for permitting removal of said fuel nozzle internally of said combustor when said additional securing means are retracted.

4,466,241

WASTE HEAT RECOVERY BOILER

Taiji Inui, Hitachi, and Makoto Sasaki, Morioka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1979, Ser. No. 4,266
Claims priority, application Japan, Jan. 18, 1978, 53-3381
Int. Cl.³ F02C *6/18*
U.S. Cl. 60—39.182 **11 Claims**



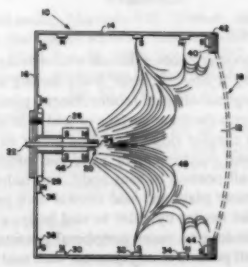
1. A waste heat recovery boiler comprising a gas passage for conducting a flue gas discharged from a gas turbine, an economizer for preheating feedwater by the flue gas, an evaporator for evaporating the preheated feedwater, and a superheater for generating steam for driving a steam prime mover by heating the evaporated feedwater, the economizer, the evaporator and the superheater being successively arranged in a direction from a downstream side to upstream side of the gas passage, characterized by dividing the evaporator into two sections in a zone in which a flue gas temperature is 300° to 450° C. in the gas passage, and providing an apparatus for removing NO_x by a chemical reaction from the flue gas in a space in the gas passage between the two divided sections of the evaporator.

4,466,242

RING-CUSP ION THRUSTER WITH SHELL ANODE

James S. Sovey, Strongsville; Vincent K. Rawlin, Wellington, and Robert F. Roman, Brook Park, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1983, Ser. No. 473,498
Int. Cl.³ F03H *5/00*
U.S. Cl. 60—202 **14 Claims**



1. An improved ion thruster for low specific impulse operation in the 1500 sec to 6,000 sec range comprising

a tubular anode shell forming a chamber for containing an ionizable propellant,

a source of high velocity electrons within said chamber for bombarding said propellant to form ions,

a high perveance optical system for extracting and accelerating ions from said chamber mounted on said anode shell at the downstream end of said chamber, said thruster having a back plate at anode potential mounted on the forward end of said anode shell thereby closing said chamber,

a plurality of rings of magnets mounted on the inner surface of said tubular shell, and

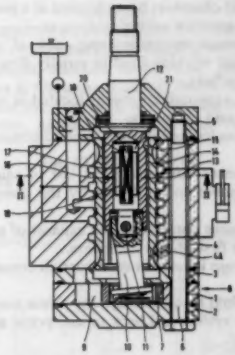
a plurality of rings of magnets mounted on the inner surface of said back plate to form with the magnets on the tubular shell a strong downstream ion flux to minimize ion losses to the side and upstream walls of said chamber.

4,466,243

HYDROSTATIC POWER STEERING SYSTEM WITH CURVED VALVE RETURN SPRINGS

Karl-Heinz Liebert, Schwabisch; Rolf Fassbender, Mutlangen, and Werner Tischer, Bobingen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, A.G., Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,326
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037660
Int. Cl.³ B62D *5/08*; F15B *13/04*; F16F *1/18*
U.S. Cl. 60—384 **9 Claims**



1. In a flow control valve having a valve sleeve rotative and axially movable in a housing with coacting grooves and passages therebetween for control of hydraulic servomotor flow, including a metering pump and an actuating sleeve **(13)** for operating said valve sleeve and said metering pump responsive to rotation of a steering shaft, and having a valve return spring device wherein said spring device **(16)** comprises arched springs **(17)** having curvatures arranged with their convex sides in contiguity and further comprising a respective pressure plate **(19)** disposed against the ends **(18)** of each spring on the outer sides thereof, including a carrier **(21)** having a slot **(20)** and said spring device being in the slot thereof under initial compression; and further including an acutating sleeve **(13)** concentric with said carrier and having diametrically opposed grooves **(22)** with the respective edges of said springs and pressure plates extending thereinto;

wherein the springs and pressure plates are elongated longitudinally of said valve sleeve so that rotation of said actuating sleeve **(13)** compresses said pressure plates against said springs between edges of said slot **(20)** and said grooves **(22)**;

the improvement comprising:

the ends **(18)** of said springs being curved reversely to the curvature of the respective spring and having sliding bearing on the respective plate.

4,466,244

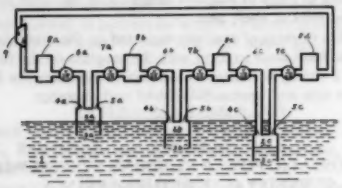
POWER GENERATION

Jiun-tsong Wu, 446 Manzanita Ave., Sierra Madre, Calif. 91024

Filed Aug. 25, 1982, Ser. No. 411,504

Int. Cl.³ F03B *13/12*

U.S. Cl. 60—398 **4 Claims**



1. An apparatus for converting ocean wave motion into useful energy comprising:

a multi-stage compression system in which a compressible working fluid is pressurized in a plurality of stages;

said compression system including a plurality of chambers opened at one end to the influence of said wave motion whereby said compressible working fluid in said chamber is compressed,

each of said chambers being located at a progressively lower vertical position within said ocean,

conduit means interconnecting each of said chambers to allow said working fluid to serially flow through each of said chambers,

a pressure accumulator means located in each conduit connecting said chambers,

valve means located in each conduit connecting said chambers,

conduit means connecting the last of said chambers to a prime mover to be driven by the compressed working fluid,

conduit means connecting the exhaust of said prime mover with the first of said chambers,

a valve means located in each conduit connecting said prime mover,

whereby fluid flows through the prime mover, to said compression system and back to said prime mover in a closed system.

4,466,245

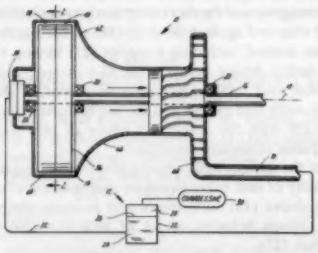
POWER PLANT HAVING A FLUID POWERED FLYWHEEL

Frank G. Arold, 145 Hillcrest Blvd., Ypsilanti, Mich. 48197

Filed Jun. 2, 1983, Ser. No. 500,260

Int. Cl.³ F01D *1/18;* **F03B** *3/00;* **F16H** *43/00*

U.S. Cl. 60—415 **21 Claims**



1. A power plant comprising a source of power fluid, a rotary output shaft, and means for converting the energy of the power fluid into rotational energy for delivery by said output shaft comprising a flywheel journaled for rotation about an axis, means for introducing power fluid to a central region of said flywheel, said flywheel comprising a body, means defining a plurality of cylinder spaces within said body spaced circumferentially about said axis, an intake port for communicating each cylinder space to the power fluid at the central region of said flywheel, an exhaust port for each cylinder space via which power fluid is exhausted, each exhaust port being spaced radially outwardly of the corresponding intake port and oriented to produce a jet effect with resulting flywheel rotation when power fluid is exhausted thereform, said cylinder spaces having curved longitudinal axes curving in the same sense about said first axis, and helical structure with a curved longitudinal axis disposed within each cylinder space and extending continuously from a point open to said intake port to a point open to said exhaust port to define a helical flow path therethrough for the power fluid, said helical structure comprising a helical reaction surface providing internal resistance against which the power fluid is effective as it passes through the cylinder space.

4,466,246

BRAKE BOOSTER AND MASTER CYLINDER WITH MOUNTING

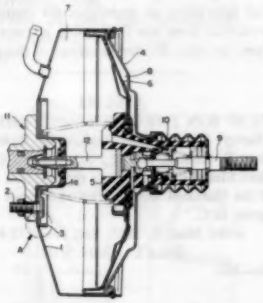
Youichi Furuta, Chiryu; Kaoru Tsubouchi, Toyota; Michiharu Nishii, Chiryu; Yuzuru Sugiura, Anjyo, and Shozaburo Tsuchida, Susono, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 15, 1982, Ser. No. 450,048

Claims priority, application Japan, Dec. 16, 1981, 56-187724[U]

Int. Cl.³ B60T *13/46*

U.S. Cl. 60—547.1 **4 Claims**



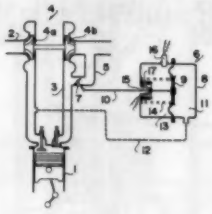
1. A brake booster in combination with a brake master cylinder, comprising a brake-booster body having a central wall portion, a doughnut-shaped reinforcement plate held in intimate contact with the inner surface of said central wall portion and having an annular ridge extending along an inner peripheral edge of said reinforcement plate and projecting against said central wall portion of said body, and bolts mounted on said reinforcement plate and said central wall portion for fastening the brake master cylinder to said body, a master cylinder flange including an inner peripheral portion held against said central wall portion in engagement with said annular ridge and an outer peripheral portion positioned radially inwardly of an outer peripheral edge of said reinforcement plate and spaced from said central wall portion by a distance such that essentially no external stresses will be imposed by said outer peripheral portion on said central wall portion when said master cylinder is actuated.

4,466,247

SYSTEM FOR CORRECTING THE EFFECT OF ALTITUDE ON A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Kenzo Aoki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 386,145
Claims priority, application Japan, Jun. 15, 1981, 56-92892
Int. Cl.³ F02B *37/12*
U.S. Cl. 60—602 **6 Claims**



1. In a system for correcting the effect of altitude on an internal combustion engine having an intake passage and an exhaust passage, a supercharging device comprising a supercharger in the intake passage, a bypass bypassing a part of said supercharging device, and a gate valve provided in said bypass, wherein the improvement comprising:

an actuator means having a housing, said actuator means for actuating the gate valve;

said actuator means including a diaphragm partitioning said housing into a supercharging pressure chamber and a sealed standard pressure chamber;

said supercharging pressure chamber communicating with said intake passage at a downstream side of said supercharger so as to be supplied with supercharging pressure;

said sealed standard pressure chamber contains air at a standard pressure;

means for operatively connecting said diaphragm with said gate valve for opening the latter by deflecting said diaphragm when the supercharging pressure exceeds said standard pressure in said sealed standard pressure chamber,

and

means for increasing the pressure in said standard pressure chamber to the standard pressure when the pressure in said standard pressure chamber becomes less than the standard pressure.

4,466,248

CONTROL DEVICE FOR THE TURBINE BYPASS VALVE OF A TURBOCHARGED INTERNAL COMBUSTION ENGINE

André Nartowski, Marly-le-Roi, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 28, 1982, Ser. No. 392,606
Claims priority, application France, Jul. 3, 1981, 81 13111
Int. Cl.³ F02B *37/12*
U.S. Cl. 60—602 **11 Claims**

1. A waste gate control device for an internal combustion engine having an accelerator pedal and supercharged by at least one turbine-compressor unit driven in a rotary manner by the engine exhaust, comprising:

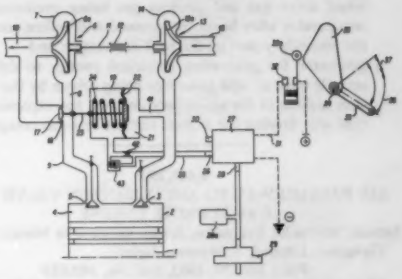
a waste gate;

at least one capsule;

a piston mounted in said capsule and connected to said waste gate;

spring means disposed in said capsule for pushing the piston in a direction closing the waste gate;

means for subjecting a first side of said piston to air feed pressure of the engine prevailing downstream of the compressor in order to bring about opening of the gate and bypass the turbine when the engine feed pressure exceeds a predetermined limited value, and for subjecting a second side thereof opposite said first side to a control fluid pressure adapted to bring about opening of the gate when the engine is under low loads; and



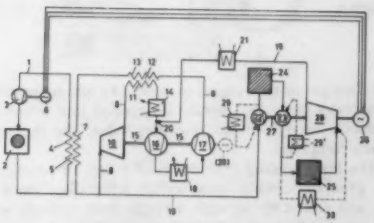
a control valve commanded by the accelerator pedal of the engine to apply the control fluid pressure to the piston only when the pedal is placed in a position which corresponds to said low engine loads.

4,466,249

GAS TURBINE SYSTEM FOR GENERATING HIGH-TEMPERATURE PROCESS HEAT

Hansulrich Frutschi, Riniken, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 18, 1981, Ser. No. 322,582
Claims priority, application Switzerland, Nov. 25, 1980, 8692/80
Int. Cl.³ F01K *13/00*
U.S. Cl. 60—648 **4 Claims**



1. In a gas turbine system for generating high-temperature process heat, the system comprising at least one primary circuit including a heat source, a primary part of a heat exchanger and a recycle blower, a secondary circuit including a secondary part of the heat exchanger in heat exchange relationship with the primary part in the primary circuit, the secondary circuit including at least one process-gas compressor, at least one process-heat exchanger and an expansion turbine, and a drive circuit connected to the secondary circuit and including a gas turbine, at least one cooler and at least one compressor;

a first junction in the secondary circuit located immediately downstream of the secondary part of the heat exchanger, the medium heated in the secondary part of the heat exchanger being divided at the first junction into a portion of drive gas for passage through the entire drive circuit and a portion of process gas for the actual genertion of process heat in the secondary circuit;

a second junction at which the process gas is combined with the drive gas, the process gas being combined with the drive gas after the process heat generated in the at least

one process-gas compressor has been given off in the at least one process-heat exchanger and the process gas has been expanded in the expansion turbine, the process gas having approximately the same thermodynamic state as the drive gas in the drive circuit at the second junction;

the combined drive gas and process gas being compressed in the at least one compressor of the drive circuit, the combined drive gas and process gas being preheated in a recuperator after being compressed and before entry into the secondary part of the heat exchanger; and

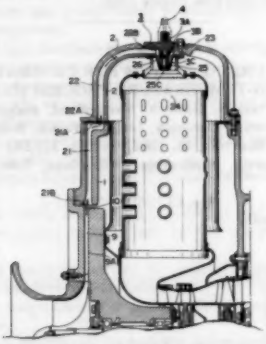
a generator for generating electrical energy to drive the recycle blower, said generator being driven by the expansion turbine in the secondary circuit , the expansion turbine also driving the at least one process-gas compressor.

4,466,250

AIR PASSAGEWAY TO AIR INJECTION VALVE FOR GAS TURBINE ENGINE

Satoshi Mukaeda, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 29, 1982, Ser. No. 343,815
Claims priority, application Japan, Feb. 3, 1981, 56-13763
Int. Cl.³ F02C *7/22*; F23D *11/44*
U.S. Cl. 60—737 **9 Claims**



1. In a gas turbine engine in which the air compressed by a compressor provided therein is supplied into a combustion chamber through an air injection valve, the improvement which comprises:

(a) a main housing provided with a first air passageway of generally circular cross section integrally formed within and extending through a single main housing wall between inner and outer surfaces thereof;

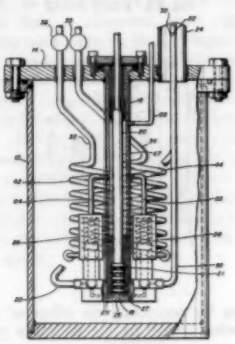
(b) a combustion chamber housing provided with a second air passageway of generally circular cross section integrally formed within and extending through a single combustion chamber housing wall between inner and other surfaces thereof, said combustion chamber housing being connected to said main housing with one end of the first air passageway and one end of the second air passageway communicating with each other, the other end of the first air passageway communicating with the compressor and the other end of the second air passageway communicating with the air injection valve, wherein a portion of the second air passageway leading into the other end of said second air passageway is gently curved to follow the contour of the combustion chamber housing wall so that the mouth of said other end of the second air passageway leading into the air injection valve is generally orthogonal to the mouth of said one end of the second air passageway, said first and second air passageways thereby defining a smoothly curved and generally direct, nontortuous air flow path between the compressor and injection valve.

4,466,251

FLUID ACTUATOR FOR CRYOGENIC VALVE

Fred F. Chellis, deceased, late of Concord, Mass. (by June M. Chellis, executrix), and Philip A. Lessard, Acton, Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Feb. 23, 1982, Ser. No. 351,523
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **8 Claims**



1. In a refrigerator having a valve operating at cold temperatures, a valve and actuator characterized by:

a fluid actuated valve at said cold temperature;

control means operating at a temperature above said cold temperature for controlling a valve actuating fluid; and

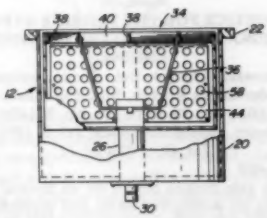
a thermally regenerative actuating-fluid flow path between the valve and control means for cooling fluid directed to the valve and reheating that fluid as it is exhausted from the valve.

4,466,252

CRYOPUMP

Charles B. Hood, Columbus, Ohio, assignor to CVI Incorporated, Columbus, Ohio

Filed Sep. 29, 1982, Ser. No. 426,518
Int. Cl.³ B01D *8/00*
U.S. Cl. 62—55.5 **9 Claims**



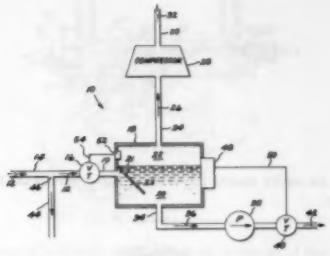
1. In a cryopump comprising an inner cryopanel adapted to freeze out gases in an evacuated environment, said cryopanel including a substrate having a layer of cryosorbing material secured to one surface thereof, said material being capable of desorbtion at room temperature, said substrate having a plurality of aligned holes such that the open area represents 30% to 70% of the surface area of the substrate, and said cryopanel including an imperforate panel juxtaposed to and spaced from said cryosorbing material.

4,466,253

FLOW CONTROL AT FLASH TANK OF OPEN CYCLE VAPOR COMPRESSION HEAT PUMPS

Heinz Jaster, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,643
Int. Cl.³ F25D 17/02
U.S. Cl. 62—188 13 Claims



1. A vapor compression open cycle heat pump having a source of fluid supplied thereto, said fluid exhibiting fluctuations in its temperature and in its rate of entry into said heat pump including inlet valve means for regulating fluid flow into said heat pump from said source of fluid; tank means connecting to said inlet valve means for holding and separating said fluid into a liquid portion and a vapor portion; a compressor fluid dynamically communicating with said tank means such that the vapor portion of said fluid can flow to said compressor; a discharge pump fluid dynamically communicating with said tank means such that the liquid portion of said fluid can flow to said discharge pump; discharge valve means fluid dynamically communicating with said discharge pump so as to regulate the flow of fluid from said pump; liquid level responsive control means associated with said tank means for monitoring and controlling the amount of liquid in the liquid portion of said fluid; and fluid pressure responsive control means mounted within said tank means for monitoring and controlling pressure of the vapor portion of said fluid.

4,466,254

REFRIGERATED SHOWCASE

Masashi Karashima, 88-5, Nakano, Ebina-shi, Kanagawa-ken, Japan

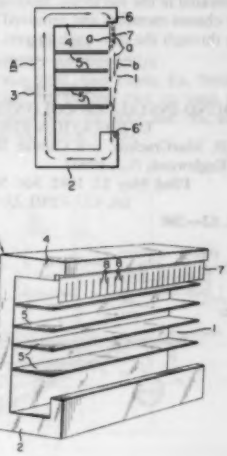
Filed Aug. 31, 1982, Ser. No. 413,437
Claims priority, application Japan, Jul. 6, 1982, 57-116216
Int. Cl.³ A47F 3/04
U.S. Cl. 62—256 13 Claims

1. A refrigerated showcase comprising;

a frame having a generally vertical rear wall, a top wall and a bottom wall, surrounding a display space, a front opening being defined between said top and bottom walls in front of said rear wall, opening into said display space, said top wall having at least one ejection port opening downwardly therefrom;

means for circulating cold air in a closed air path vertically downwardly out of said at least one ejection port across said front opening and successively through said bottom wall, said rear wall and said top wall to said at least one ejection port, such that the temperature profile of the cold air circulated at one of said at least one ejection port is constant in a horizontal direction generally toward said rear wall; and

a guide plate, having a short vertical length relative to the vertical length of said opening, hanging below said top wall across a top portion of said opening from a middle portion of said one of said at least one ejection port so that



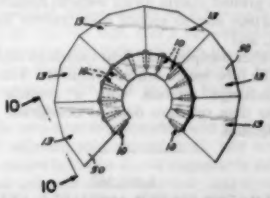
the air temperature is the same on opposite sides of said guide plate.

4,466,255

COOLING SYSTEM FOR ELECTRONIC ASSEMBLY

M. Dean Roush, Chippewa Falls, Wis., assignor to Cray Research, Inc., Minneapolis, Minn.

Filed Sep. 2, 1982, Ser. No. 414,448
Int. Cl.³ F25D 23/12
U.S. Cl. 62—259.2 3 Claims



1. A cooling system for an electronic assembly, comprising:

a plurality of elongate chassis members of high heat conductive material;

means for positioning said chassis members in parallel relation spaced to receive electronic circuit modules between adjacent pairs of chassis members;

said chassis members having means along adjacent sides thereof for receiving electronic modules in heat conducting contact therewith;

said chassis members having a plurality of refrigerant holes extending through the length thereof and spaced internally thereof generally adjacent the side areas thereof which receive said electronic modules;

pairs of end caps for attachment to opposite ends of said chassis members adjacent the ends of said refrigerant holes, said end caps cooperating with said chassis members for forming refrigerant passages interconnecting selected ones of said refrigerant holes into groups to form refrigerant flow paths having multiple passes through said chassis members; and

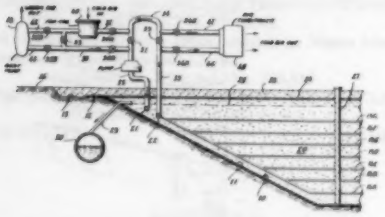
refrigerant inlets and outlets in said end caps for said chassis members in fluid communication with the refrigerant flow paths for connection to an external refrigeration system for circulating refrigerant therethrough, whereby heat generated in the electronic modules is conducted through the chassis members and removed by refrigerant circulating through the flow path therein.

4,466,256

GROUND-INSTALLED COLDNESS STORAGE AND UTILIZATION SYSTEM

Calvin D. MacCracken, c/o Calmac Manufacturing Corporation, Englewood, N.J. 07631

Filed May 12, 1982, Ser. No. 377,667
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—260 **4 Claims**



1. A method of storing and utilizing coolness in the ground wherein a pit is excavated and lined with a liquid-impermeable membrane and back-filled with water-permeable soil in which is buried tube means providing a heat-exchange flow path, said method comprising:

(a) permeating the back-filled soil with water to a level above the tube means and below upper ground surface,

(b) freezing the water-permeated back-filled soil into a frozen ground matrix around the tube means by pumping a sub-zero degrees centigrade heat exchange liquid through the tube means,

(c) thermally insulating the upper surface of the back-filled soil above said water level to allow for expansion as the frozen-ground matrix forms without disturbing the upper soil surface and to reduce heat transfer into the frozen matrix, and

(d) thereafter pumping said heat-exchange liquid on demand from the tube means buried within the frozen matrix into heat-exchange relation with a medium substantially warmer than sub-zero degrees centigrade so as to cool said medium.

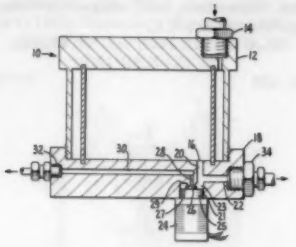
4,466,257

REFRIGERATED FILTER ASSEMBLY AND METHOD OF USING SAME

Richard K. Pefley, and J. Barrett Pullman, both of Santa Clara, Calif., assignors to Prodatek Corporation, Portola Valley, Calif.

Filed Aug. 17, 1982, Ser. No. 408,911
Int. Cl.³ F25D *3/02*
U.S. Cl. 62—318 **9 Claims**

1. A self-aided refrigerated filter assembly for maintaining a fluid in fluid phase during filtration comprising a filter means for filtering a flow of a fluid in liquid phase; a heat sink means with means connected to and in fluid communication with said filter means; and a control means with means connected to said heat sink means for controlling a portion of the fluid in liquid phase through said heat sink means, the heat sink means further comprising a first passage and second passage in fluid communication with each other for receiving the fluid in liquid phase outflowing from said filter means and channeling it for passage out of the heat sink means, a void in fluid communication with said first and second passage for receiving at least a portion of the fluid in liquid phase outflowing from said filter means, a third passage in fluid communication with said void, and a fourth passage in fluid communication with said third passage



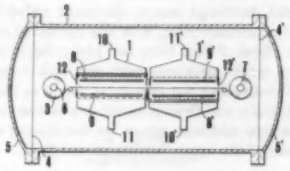
having an outlet means for venting the contents in said fourth passage.

4,466,258

APPARATUS FOR LOW-TEMPERATURE PLASMA TREATMENT OF A TEXTILE PRODUCT

Yoshikazu Sando, Wakayama; Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Hiroshi Ishidoshiro, and Matsuo Minakata, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Dec. 22, 1982, Ser. No. 452,101
Claims priority, application Japan, Jan. 6, 1982, 57-817; Jan. 6, 1982, 57-819
Int. Cl.³ D06B *3/00*
U.S. Cl. 68—5 C **1 Claim**



1. An apparatus for low-temperature plasma treatment of a textile product, comprising two reaction chambers arranged in series in a reduced pressure vessel, two opposing electrode plates arranged in each said chambers forming a passage of a textile product to be treated therebetween, each of said chambers having a gas nozzle for jetting a gas from outside of the reduced pressure vessel to the electrode plates, and a gas duct provided at the opposite position to the gas nozzle for exhausting the gas and evacuating the reduced pressure vessel, the combination of plates and gas nozzles operating to produce the plasma.

4,466,259

ADJUSTABLY POSITIONABLE LOCKING DEVICE FOR TANK CAPS

Gordon L. Osgood, Sr., 61407 Spring Circle Trail, Romeo, Mich. 48065

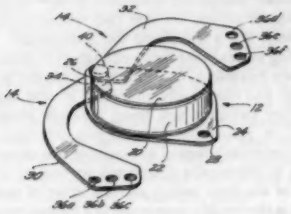
Filed Aug. 16, 1982, Ser. No. 408,463
Int. Cl.³ B65D *55/14*
U.S. Cl. 70—164 **8 Claims**

1. A locking device for locking a cap upon the filling neck of a tank comprising:

(A) a generally cylindrical cup-like body member; and

(B) a pair of inwardly extending collar parts, the ends of the collar parts being disposed in an overlying relationship, a first end of each of said collar parts being independently

pivotally secured to a peripheral portion of said body member and the second ends of each of said collar parts being apertured and movable relative to each other and said body member between enabling and locking positions, said collar parts in said enabling position enabling the inwardly extending portions of said collar parts to bypass the tank cap as the device is installed or removed and in said locking position underlying the peripheral



portion of the tank cap to prevent removal of the device, said body member and said collar parts being cooperable with a securing means for lockably securing said body member and said collar parts against movement;

said body member and collar parts being capable of assuming first and second locking positions, and said body member and tank cap being axially aligned in said first locking position and axially offset in said second locking position.

4,466,260

ANTITHEFT DEVICE FOR TRAILERS AND SEMITRAILERS

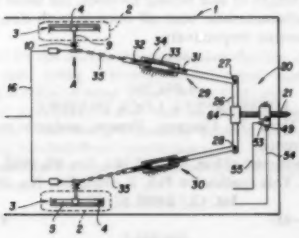
Domenico Panetta, Cesano Boscone, Italy, assignor to Unifilter di D. Panetta, Italy

Filed Apr. 28, 1982, Ser. No. 370,149

Claims priority, application Italy, May 4, 1981, 21499 A/81

Int. Cl.³ F16C *3/00;* **E05B** *65/12*

U.S. Cl. 70—181 **4 Claims**



1. An antitheft device for trailers and semitrailers provided with an axle, brakes connected to said axle and a service brake circuit for actuating said brakes, characterized in that it comprises a traverse having two spaced apart fixed portions, an axially movable threaded rod which can be screwed in a threaded hole formed in a block integral to a fixed portion of the trailer or semitrailer and having one end thereof idly engaged within a recess formed in a body rigidly connected to a portion of said traverse spaced apart from said fixed portions, said traverse being pivoted, at said fixed portions, on the ends of a pair of tie rods, the other ends of these tie rods being connected to corresponding levers which actuate said brakes, said tie rods being freely slidable according to a reciprocating motion within two respective spaced apart tubular guides integral to the trailer or semitrailer, said antitheft device also comprising a non-return valve connected to the service brake circuit and a latch control member operable by a key or the like, which simultaneously acts on the threaded rod and on the non-return valve, locking, in one position thereof, the axial movement of the threaded rod in the block and the brake circuit and restoring, in a second position thereof, the possibility of movement of the threaded rod and the brake circuit.

4,466,261

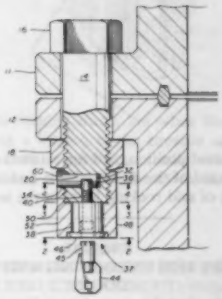
SECURITY APPARATUS

John C. Zimmer, P.O. Box 2235, New Iberia, La. 70560

Continuation-in-part of Ser. No. 198,299, Oct. 20, 1980, Pat. No. 4,358,941. This application Nov. 15, 1982, Ser. No. 441,907

Int. Cl.³ F16B *41/00*

U.S. Cl. 70—229 **7 Claims**



1. A security device which comprises:

(a) a cylindrical bolt having formed therein a radial first hole substantially perpendicular to the axis of said bolt and a threaded second hole formed coaxially within said bolt and intersecting said first hole;

(b) a nut threadably engageable with said bolt;

(c) a bar insertable into said first hole, said bar having a length sufficient such that an end thereof extends radically outside said bolt when said bar is inserted in said first hole, said bar having a notch therein alignable with said second hole when said bar is inserted into said first hole;

(d) a key-operable pick-resistant lock having a lock body with at least one flat side, and a key-operable screw including key releasable lock structures to rotate said screw with respect to said lock body, said screw being threadably engageable with said second hole to engage said notch of said bar; and

(e) means for non-rotatably securing said lock to the end of said bolt adjacent said second hole, said non-rotatable securing means having a sleeve engageable with said end of said bolt adjacent said second hole, said sleeve comprising means for engaging said bar for preventing rotation of said sleeve with respect to said bolt, said engaging means defining a hole having a cross-section conformed to fit said lock body so as to prevent rotation of said lock body with respect to said sleeve.

4,466,262

STEERING LOCK

Giuseppe A. Maiocco, Rivoli, and Pietro Frascarolo, Druento, both of Italy, assignors to Champion Spark Plug Italiana S.p.A., Druento, Italy

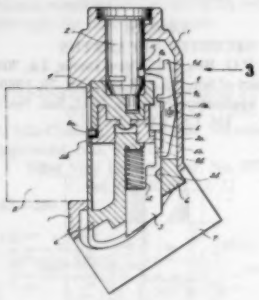
Filed Jan. 28, 1983, Ser. No. 461,989

Int. Cl.³ B60R *25/02*

U.S. Cl. 70—252 **7 Claims**

1. A steering lock comprising a lock cylinder, a latch movable between a first position in which it is operable and a second position in which it is inoperable to engage a recess in a steering shaft of an associated motor vehicle, an exterior housing, means operable to move said latch from its first position to its second position, a rocking lever, means mounting

said rocking lever for rotation in a plane which is axial of the steering lock between a first position in which it is operable and a second position in which it is inoperable to lock said



latch in its second position, and for rotation in a second plane which is not axial of the steering lock, and means operable to cause rotation of said rocking lever in the second plane.

4,466,263

DEVICE FOR THE UNLOCKING AND LOCKING OF DOORS

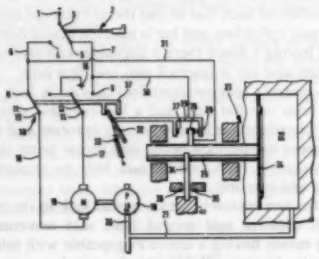
Klaus Rathmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 380,500

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121367

Int. Cl.³ E05B *53/00*

U.S. Cl. 70—264 **10 Claims**



1. In a device for the unlocking and locking of doors, particularly the doors of automotive vehicles, in which locking mechanisms with pneumatic setting members are provided on individual doors and a pneumatic pump having a motor of controlled direction of rotation is provided centrally, the pump being operatively connected to the pneumatic setting members of the locking mechanisms, the device being actuated by a door key by at least one door switch having two fixed contacts defining two positions for the door switch, and a holding circuit means controlled by a holding circuit switch being provided for both positions for assuring, even upon merely a brief contacting by the door switch with one of the contacts, that the setting members always move into an end position associated therewith, the device having means for switching current in the device when a corresponding end position of the setting members is reached, the improvement wherein

said motor constitutes a DC motor,

said holding circuit switch comprises

means including a diaphragm defining a pressure chamber communicating with said pump,

a piston rod connected to said diaphragm and axially displaceable by said diaphragm,

a contact finger being mounted on said piston rod,

a contact bridge mounted displaceably parallel to the piston rod and having two spaced contacts, said contact finger on said piston rod extending between said two contacts of said contact bridge and being adapted to contact either of said two contacts of said contact bridge or to be spaced from both of said two contacts of said contact bridge and constitutes means for displacing said contact bridge via said two spaced contacts, respectively, when said piston rod is displaced,

said switching means comprises a change-over switch means having two bistable switch members arranged parallel to each other and electrically connected to said motor, said change-over switch means being movable between two positions, in respective of said two positions of said change-over switch means, a respective one of said switch members is electrically connected to one of said fixed contacts of the door switch and the other of said switch members is electrically connected to a ground connection, respectively, whereby said two fixed contacts of said door switch respectively being connected electrically to the motor via the change-over switch means,

said contact bridge is operatively mechanically connected with said switch members of the change-over switch means,

said holding circuit means includes said two contacts of the contact bridge being electrically connected to one of the fixed contacts of the door switch and said contact finger of said piston rod electrically connected to the other of said fixed contacts,

a flexing member constituting means for biasing and holding respectively said piston rod in a basic position with said contact finger not contacting either of said two spaced contacts, said flexing member is connected to said piston rod and flexing upon displacement of said piston rod,

two abutment means each respectively for contacting said flexing member when said piston rod is displaced predetermined extents in respective of two axial directions of displacement, and upon said contacting for shortening the flexing length of said flexing member, the latter having a spring characteristic bent off once in both directions of displacement, respectively.

4,466,264

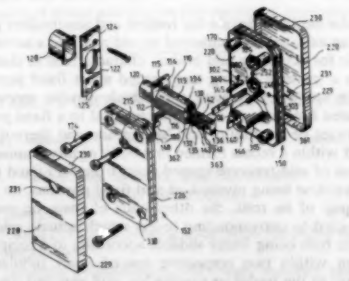
HIGH SAFETY LOCK DEVICES

Claude del Nero, Le Chesnay, France, assignor to Fichet-Bauche, France

Continuation-in-part of Ser. No. 113,182, Jan. 18, 1980, Pat. No. 4,316,371. This application Feb. 3, 1982, Ser. No. 345,421

Int. Cl.³ E05B *63/00*

U.S. Cl. 70—417 **37 Claims**



1. A combination of plate assemblies for use in a high safety lock having a control bar for actuating a dead bolt in an edge

of a door leaf and means, including a first and a second tail piece, accessible on either side of the door leaf for controlling motion of the control bar,

said combination comprising a first plate assembly adapted to be mounted on the outer face of the door leaf and a second plate assembly which is adapted for being mounted on the inner face of the door leaf;

each said plate assembly comprising:

a first plate adapted to be placed on the side of the door leaf and having formed therein a first passage opening for providing a controlling access from the outside of said plate assembly to a respective one of the tail pieces; and at least a second opening for housing a portion of said controlling means which is operative to transmit motion from the other of said tail pieces to the control bar; and

a second plate coupled to the first plate on the outer face thereof for preventing access from the outside of said plate assembly to the second opening in said first plate and comprising a through going hole to provide controlling access from the outside of said plate to said one tail piece via said first opening in said first plate.

4,466,265

COMPOUND TOOL FOR HOT-WORKING

Otto Wessel, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann A.G., Duesseldorf, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,806

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3114177

Int. Cl.³ B21B *19/04*

U.S. Cl. 72—97 **11 Claims**

1. A tool for the hot-working of steel or the like, comprising:

a first part, being a powder-metallurgical part having a surface-defining wear zone for the tool; and

a second part, being a steel part having been cast onto the first part and being intimately bonded thereto; a bond having resulted from interfacing of the first part with the molten steel during casting, thereby establishing the compound tool.

4,466,266

FORGING APPARATUS

Robert M. Gardaer, and Ronald L. Thompson, both of Worcestershire, England, assignors to GKN Forgings Limited, Bromsgrove, England

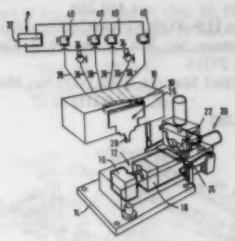
Filed Oct. 4, 1982, Ser. No. 432,444

Claims priority, application United Kingdom, Oct. 8, 1981, 8130432

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—357 **13 Claims**

1. An improved mechanical crank press for the production of flashless forgings from metal billets or pre-forms wherein the press comprises a die assembly defining a die cavity, a press-head reciprocable towards and away from the die assembly and a die-head carried on the press-head to be co-operable, during a forging stroke, with the die assembly to forge a metal billet or pre-form located in the die cavity to a shape corresponding to the shape bounded by the die cavity and the die-head; the die assembly being openable and closable; releasable locking means to lock the die assembly in its closed condition during the forging stroke of the press; the die-head being movable axially towards the press-head; and fluid pressure means for maintaining the die-head in a fully extended position outward from the press-head at a predetermined maximum fluid



pressure during the forging stroke but when the pressure on the die-head during a forging stroke exceeds said maximum pressure said die-head reciprocates axially relative to and toward the press-head to protect the die-head and prevent press stalling.

4,466,267

PROCESS FOR FORMING CURVED STRUCTURES, AND THE RESULTING STRUCTURES

William A. Casler, 3487 Barhite St., and Phillip E. Saurenman, 3438 Vosburg St., both of Pasadena, Calif. 91107

Filed Oct. 28, 1981, Ser. No. 315,917

Int. Cl.³ B21D *51/10*

U.S. Cl. 72—368 **9 Claims**

1. The process of forming a metal cylinder which has a central axis, a dimension of axial length, and an inner and outer wall from a sheet of metal having a uniform dimension of wall thickness, a pair of ends, and a pair of edges, said process comprising:

using a mandrel having an outer surface with the shape of the desired inner wall of the structure and a plurality of die members, each die member having an inner wall surface providing die-mandrel closure clearance substantially equal to said wall thickness over the major portion of said axial length when said die members are closed, an interior end face extending radially and facing toward said inner wall surface, one of said surfaces including an arcuately extending portion more closely approaching the axially aligned portion of the other surface than other portions of said one surface when the die members are closed, placing said sheet of metal between said surfaces and moving said die members and mandrel toward one another and against said sheet, whereby to curve said sheet into a cylinder, there being a lesser resulting wall thickness at said arcuately extending portions because of their closer approach, said arcuately extending portions thereby causing, toward the final closure of the die members both radial and axial flow of metal at an end of said cylinder into at least partial contact with both said arcuately extending portion and

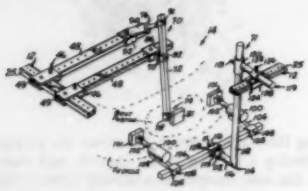
with said interior end face whereby to form an end on said cylinder of reformed metal conforming with at least portions of two defining surfaces of each said die member.

4,466,268

APPARATUS FOR STRAIGHTENING VEHICLE

Robert P. Matson, Sr., Rte. 9, Box 592B, Durkee Rd., Cleveland, Tenn. 37311

Filed Mar. 16, 1982, Ser. No. 358,713
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—389 **7 Claims**



1. A straightening apparatus for use in straightening the bent portions of vehicles including:

a support frame in which the vehicle is positionable;

a pusher unit adjustably mounted on said support frame and adapted to engage the bent portion of the vehicle and apply a straightening force thereto in a first direction; and

a backup unit adjustably mounted on said support frame and adapted to engage the vehicle in the vicinity of and in opposition to said pusher unit and apply backup forces to the vehicle oriented generally parallel to said straightening force and in a second direction opposite to said first direction so that the bent portion of the vehicle can be straightened back to its original shape without deformation of the unbent portions of the vehicle, said backup unit including an elongate cross member; a pair of fluid cylinders, each having an extendable piston rod; a pair of backup pads, one being mounted on each of the piston rods; a pair of support assemblies mounting said fluid cylinders on said cross member for selected movement of said fluid cylinders along said cross member toward and away from each other while maintaining the axes of said fluid cylinders parallel to each other and normal to the central axis of said cross member; and a positioning assembly adjustably mounting said cross member on said support frame for selected movement of said cross member with respect to said support frame axially along a first path parallel to the central axis of said cross member; rotationally about a second path normal to and intersecting the central axis of said cross member and parallel to the axes of said fluid cylinders, axially along and rotationally about a third path normal to said first and second paths, and axially along a fourth path parallel to said second path.

4,466,269

CONVOLUTED TUBE BENDING TOOL

Robert Farrell, Wilmette, Ill., assignor to Evereo Industries Inc., Lincolnwood, Ill.

Filed Sep. 27, 1982, Ser. No. 424,066
Int. Cl.³ B21J *13/08*
U.S. Cl. 72—459 **7 Claims**

1. A tube bending tool comprising,

(a) an arcuated bending shoe providing along its peripheral edge a pipe receiving track,

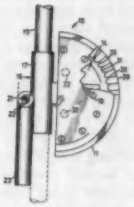
(b) means formed on the face of said track providing a series of fulcrums over which a tube is succedingly bent,

(c) means providing a handle receiving member connected to said bending shoe along a radius thereof,

(d) means connecting said handle receiving member to said shoe at a point along the center radius of said shoe for free limited pivotal movement of said member relative to said shoe,

(e) a handle received in said handle receiving member and extending radially beyond the arcuated peripheral edge of said bending shoe,

(f) a self adjusting looped tube securing member pivotally



connected to said handle receiving member for securing a portion of the tube to be bent in either end of said track as said handle receiving member is initially pivoted relative to said shoe, and

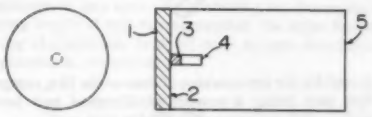
(g) means for connecting said tube securing member to said handle receiving member for pivotal movement relative thereto.

4,466,270

REFERENCE BLOCK USED IN ULTRASONIC EXAMINATION

Katsuyoshi Kimura, Tokyo, and Shojiro Matsumoto, Kashiwa, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,286
Claims priority, application Japan, Sep. 12, 1980, 55-126006
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—1 R **12 Claims**



1. A reference block for ultrasonic examination, said blocking having an ultrasonic absorber secured to its back surface and producing substantially no ghost indication at a pulse repetition frequency of 250 to 2,000 Hz.

4,466,271

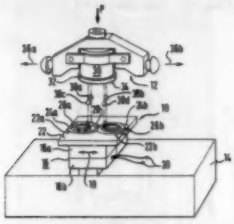
APPARATUS FOR TESTING LUBRICATING AND MATERIAL PROPERTIES

Oswald Geromiller, Bad Wiessee, Fed. Rep. of Germany, assignor to Optimol-Öiwerke GmbH

Filed Jan. 20, 1983, Ser. No. 459,672
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206971
Int. Cl.³ G01N *3/56, 19/02*
U.S. Cl. 73—10 **13 Claims**

1. A testing apparatus for testing the lubricating properties of lubricants and the sliding and rolling properties of materials, comprising a first clamping assembly and a second clamping assembly, each of said first and second clamping assemblies having a clamping surface facing said clamping surface on the other said clamping assembly freely moving, elements capable of at least one of rolling or sliding positioned between and in contact with said clamping surfaces, said first and second clamping assemblies arranged to be pressed against one another with said elements pressed between said clamping sur-

faces, means for effecting relative oscillating movement between said first and second clamping surfaces in a direction perpendicular to the direction in which said clamping assemblies are pressed together, a measuring unit in at least one of said first and second assemblies for determining the pulling force transmitted between said clamping assemblies by said elements where the pulling force acts in the relative oscillating direction of said clamping assemblies, wherein the improvement comprises that said clamping surface of said first clamping assembly includes first synclinal annular roller paths with the axes thereof disposed in spaced apart relation, and said first roller paths having a common plane tangent to the bottom line of said first roller paths, said clamping surface of said second clamping assembly having a second synclinal annular roller path, said second roller path having a second plane tangent to the bottom line of said second roller path, said first and second planes being disposed in parallel, and said elements comprising two elements located in each of said first roller paths with the four said elements each located in said second roller path.



4,466,272

FLUID DENSITY TRANSDUCER

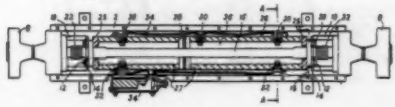
James W. Stansfeld, Alton, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Continuation of Ser. No. 203,841, Nov. 4, 1980, Pat. No. 4,354,377. This application May 28, 1982, Ser. No. 382,905

Claims priority, application United Kingdom, Nov. 6, 1979, 7938367

Int. Cl.³ G01N *9/00*

U.S. Cl. 73—32 A **3 Claims**



1. A fluid density transducer comprising a tube extending between node-determining masses, and an electrical transducer arrangement coupled to the tube for exciting natural transverse vibrations and providing an electrical signal representative of the frequency of vibration, wherein the tube is supported at each end relative to a supporting structure by a resilient annular plate connected around one periphery to the supporting structure and around the other periphery to the tube, and said tube is provided with a flexible connection for passage of fluid at each end thereof.

4,466,273

LEAK DETECTION SYSTEM

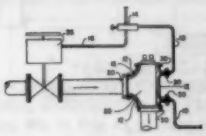
Kibbie P. Pillette, P.O. Box 456, Abbeville, La. 70510

PCT No. PCT/US80/01447, § 371 Date Jul. 20, 1981, § 102(e) Date Jul. 20, 1981, PCT Pub. No. WO82/01591, PCT Pub. Date May 13, 1982

Continuation-in-part of Ser. No. 954,578, Oct. 23, 1978, Pat. No. 4,232,736, which is a continuation-in-part of Ser. No. 786,576, Apr. 11, 1977, abandoned. This PCT application Oct. 29, 1980, Ser. No. 292,121

Int. Cl.³ G01M *3/28*

U.S. Cl. 73—46 **8 Claims**



1. An apparatus for detecting leaks in suspect pipe fittings comprising:

a. a removable enclosure for encapsulating a suspect pipe fitting where leakage might occur;

b. the enclosure forming a space adjacent the fitting for collecting fluid leaking from the fitting; and

c. a pneumatically actuated relay connected with the space for responding to a pressure increase within the enclosure caused by leaking fluid by using the leaking fluid as instrumentation fluid to operate the pneumatically actuated relay.

4,466,274

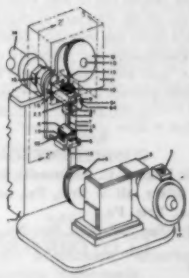
SLIDING FILM RHEOMETER

Frank C. Starr, Jr., 2010 Harvey Rd., Wilmington, Del. 19810

Filed Jun. 28, 1982, Ser. No. 392,727

Int. Cl.³ G01N *11/04*

U.S. Cl. 73—54 **6 Claims**



1. A sliding film rheometer for measuring the viscosity of a molten polymer by simultaneously measuring in the same shear field shear stress and normal stress comprising:

(i) a shear stress and normal stress producing member consisting of a tape having a rectangular shaped cross-section;

(ii) a measuring cell containing molten polymer heated to a constant temperature having an inlet orifice and a rectangularly shaped outlet slit, said rectangular shaped outlet slit being adapted to be slightly larger than the cross-section of said tape;

(iii) means for pulling, at a controlled rate of speed, said tape through said inlet orifice, then through said molten polymer, and then through said rectangular shaped outlet slit, thereby producing shear stress and normal stress; and

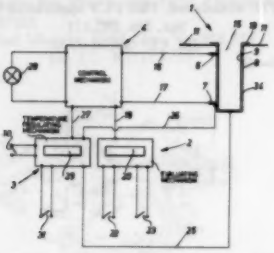
(iv) measuring means operatively connected to said measuring cell for simultaneously measuring said shear stress and normal stress produced in said molten polymer.

4,466,275

ARRANGEMENT FOR MEASURING VISCOSITY

Ernst Thöne, Sorenkoppel 10e, 2000 Hamburg 73, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,475
Int. Cl.³ G01N *11/12*
U.S. Cl. 73—57 **25 Claims**



1. An arrangement for measuring the viscosity of a fluid by measuring the time which elapses during travel of a standard element through a predetermined distance in such fluid, comprising a vessel for accommodating a body of the fluid whose viscosity is to be measured; a container accomodating said vessel and defining therewith a narrow gap; sensing means including a pair of sensing devices installed in said container at said predetermined distance from one another, said sensing means being arranged to generate impulses in response to movement of the standard element past said sensing devices; temperature regulating means including at least one temperature sensing device installed in said gap for monitoring the temperature of the fluid in said vessel and heating means for heating such fluid; control means connected to both the sensing means and the temperature regulating means, said control means being arranged to regulate the temperature of the fluid in said vessel and to actuate the sensing means when the temperature of the fluid in said vessel reaches a desired value; and evaluating means connected to said sensing means for measuring the travel time of the standard element through said predetermined distance from the impulses generated by said sensing means and for calculating the viscosity of the fluid based on said travel time, said evaluating means being programmable relative to specific gravity and temperature.

4,466,276

CONSISTOMETER

Robert F. Ruyak; Stephen G. Ratkowski; Samuel D. Ciprich, and Theodore R. Silver, all of Erie, Pa., assignors to Autoclave Engineers, Inc., Erie, Pa.

Filed Sep. 28, 1982, Ser. No. 425,871
Int. Cl.³ G01N *11/00*
U.S. Cl. 73—59 **11 Claims**

1. A high temperature and high pressure consistometer comprising:

a cylindrical pressure vessel having an integral bottom;

a cover for said pressure vessel;

means for securing and sealing the cover to the vessel;

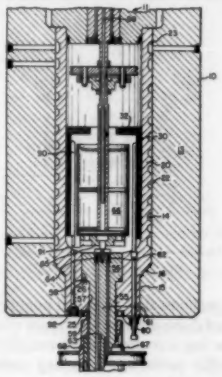
a nonmagnetic canister extending downwardly from said bottom and being sealed therein, a lower driven permanent magnet assembly being journaled in said canister for unlimited rotation, a drive shaft connected to said lower driven permanent magnet assembly extending into said vessel;

a nonmagnetic canister extending upwardly from the cover and being sealed therein, an upper driving permanent magnet assembly being journaled in said canister, a shaft connected to said upper driving permanent magnet assembly extending downwardly into said vessel;

a lower driving permanent magnet assembly mounted for rotation on the exterior of the downwardly extending canister and an upper driven permanent magnet assembly mounted for rotation on the exterior of the upwardly extending canister;

a sample cup connected to the upwardly extending drive shaft and a paddle connected to the downwardly extending shaft being positioned within the cup;

means for introducing pressurizing fluid into the vessel and means for heating the vessel interior;



means external the vessel for measuring the torque magnetically transferred from the shaft carrying the paddle to the driven magnet assembly; and

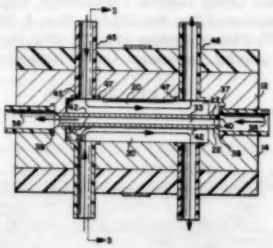
means for causing the driving magnet assembly to rotate at a constant speed to thereby drive the cup within the vessel at a constant speed.

4,466,277

THERMAL CHAMBERED FLOW CELL

Robert E. Baier, Eggertsville; Raymond W. King, Buffalo, and Anne E. Meyer, N. Tonawanda, all of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,244
Int. Cl.³ G01N *17/00*
U.S. Cl. 73—61.2 **4 Claims**



1. A flow cell for monitoring accumulations of microscopic material on surfaces of plates exposed to a primary flow of fluid, comprising:

means defining a housing,

means in said housing supporting a pair of plates in closely spaced relation,

means in said housing for applying a flow of primary fluid to be monitored through the space between said plates and in contact with the adjacent surfaces of said plates,

means in said housing defining a pair of chambers, one each positioned at the opposite side of each of said plates with

said plate opposite sides at least partially forming a closure wall to its associated said chamber, and

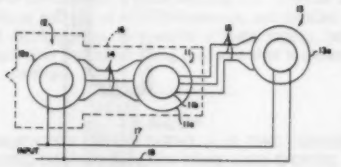
means in said housing for admitting a secondary fluid flow into said chambers for contact with the opposite surfaces of said plates.

4,466,278

SELF-ADJUSTING BIAS FOR SYNCHRO SYSTEM

Casimer F. Remus, Tunkhannock, Pa., assignor to The Bendix Corporation, Flight Sys. Div., Teterboro, N.J.

Filed Nov. 22, 1982, Ser. No. 443,514
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—115 13 Claims



1. In a system for sensing a condition of a gas turbine on a vehicle by sensing an engine pressure ratio of the turbine, in which the turbine has a first condition measuring means, transmitting means for transmitting a signal containing information from said measuring means and means for receiving corresponding information, apparatus to compensate for ambient conditions characterized by:

(a) a second condition sensor providing a sensed second condition;

(b) differential transmitter means connected to the transmitting means, to the receiving means and to the second condition sensor for receiving the information transmitted by the transmitting means and transmitting the corresponding information to the receiving means;

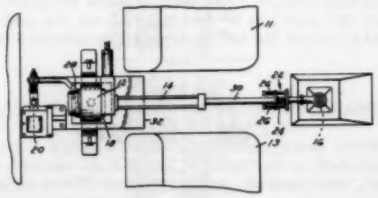
(c) the differential transmitter means varying the signal from the transmitting means to provide the corresponding information in accordance with the sensed second condition.

4,466,279

AUTOMATED MANUAL TRANSMISSION SHIFTER

Stewart V. Gable, Ypsilanti; Robert N. Glover, Livonia; Francis G. King, Birmingham, and Raymond C. Meier, Jr., Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 22, 1982, Ser. No. 421,559
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117 6 Claims



1. A transmission gear shifting apparatus for the automatic operation of a manual gear shift mechanism in an automotive vehicle, the automotive vehicle having a gear shift lever with a plurality of manual shift positions, said gear shifting apparatus including:

a lead screw assembly means coupled to the gear shift lever for actuating movement of the gear shift lever in a first direction;

a DC motor coupled to the lead screw assembly means for providing turning of the screw and thereby rapid axial movement of the lead screw assembly facilitating movement of the gear shift lever in said first direction;

a pivotal mounting for said lead screw assembly for providing movement in a second direction, said second direction being generally perpendicular to said first direction;

a solenoid means for providing a force causing movement of said lead screw assembly in said second direction;

a tachometer means coupled to said DC motor for providing a velocity feedback; and

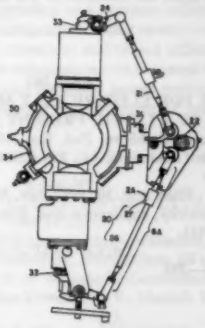
a linear displacement transducer coupled to said lead screw assembly for providing a position feedback.

4,466,280

HYDRAULIC LIFTER TRAIN CLEARANCE CONTROL SYSTEMS, ELEMENTS AND PROCESSES

Howard J. Kopel, Rte. 2, Box 13, Hooker, Okla. 73945

Filed Jun. 2, 1982, Ser. No. 384,276
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 6 Claims



5. Process comprising steps of testing a hydraulic valve lifter assembly while it is attached to an operating engine comprising the steps of placing a metering orifice test apparatus in said valve lifter during operation of said engine and determining the flow characteristics of said valve lifter during operation of said engine, and replacing the metering test orifice test apparatus in said hydraulic valve lifter assembly with a metering orifice of similar flow characteristic.

4,466,281

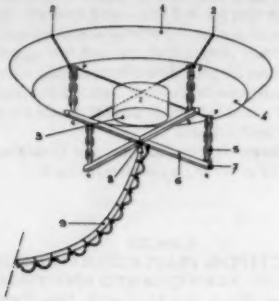
BUOY FOR MEASURING WAVE SLOPES

Petrus J. Rademakers, Aerdenhout, Netherlands, assignor to Datawell B.V., Haarlem, Netherlands

Filed Jan. 11, 1982, Ser. No. 338,626
Claims priority, application Netherlands, Jan. 15, 1981, 8100164
Int. Cl.³ B63B *21/52*; G01F *23/06*
U.S. Cl. 73—170 A 16 Claims

5. Buoy adapted to follow wave slopes provided with a closed central axially symmetric vessel provided with instrument means for measuring said wave slopes, said central vessel being surrounded by an axially symmetric or almost axially symmetric disc shaped float body having a horizontal bottom surface with a diameter that is greater than the height of the float body, said closed vessel protruding downwardly from said float body, the part of the vessel protruding downward from the float body comprising means for causing, in case of horizontal movements of the water with respect to the buoy, a pressure distribution on said bottom surface outside said protruding part, which creates a tilting momentum that opposes

and overrides the tilting momentum exerted by said water movement on said protruding part, said protruding part having



at the level where it emerges from the float a diameter between 0.2 and 0.8 times the diameter of the said bottom surface.

4,466,282

DEVICE FOR ELECTRICALLY MONITORING THE LEVEL OF A LIQUID PRESENT IN A CONTAINER

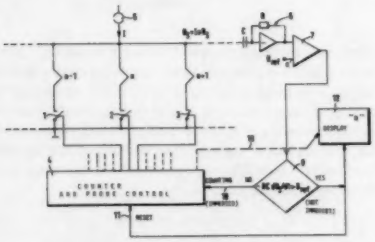
Frank Kühnel, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,808

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3133421

Int. Cl.³ G01F *23/00*

U.S. Cl. 73—295 14 Claims



1. In a device for electrically monitoring the level of a liquid present in a container, having a plurality of temperature-dependent resistance probes which are arranged at different heights in the container and which are to be connected one after the other to a source of constant current under the control of a program control device, with means for evaluating the voltage drop over said resistance probes and means for forming the display signal from the different voltages of the resistance probe, the improvement wherein

said means for evaluating the voltage drop across the resistance probes is connected to the source of constant current and comprises a differentiator as well as a comparator, said comparator being connected behind the differentiator and acted on by a threshold voltage, and

said means for forming the display signal is connected with said comparator and comprises a counter which counts signals of the comparator corresponding to a count of the number of resistance probes whose voltage differential is above the threshold voltage after connection to the source of constant current.

4,466,283

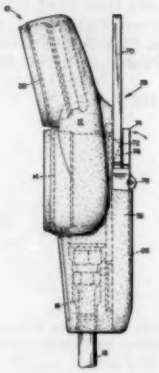
DIVERS CONSOLE WITH KNIFE AND SHEATH

Ralph F. Osterhout, 340 Lombard St., San Francisco, Calif. 94133 (now by change of name from Ralph Barr Shamlian)

Filed Jul. 23, 1982, Ser. No. 401,364

Int. Cl.³ G01F *23/14;* B26F *3/00, 11/00*

U.S. Cl. 73—300 12 Claims



1. For mounting a knife and sheath in structural assembly with one or more diver'gauges, console means comprising casing means for mounting one or more of said gauges whereby said one or more gauges may be read by the diver while underwater; and means associated with said casing means for mounting sheath means, for a knife or the like, in structural, relatively rigid assembly with said console means, one of said gauges being a source of compressed breathing gas pressure indication gauge having a hose interconnecting the pressure gauge and the source, said casing means enclosing a portion of the hose adjacent the gauge and encasing the pressure gauge except for the dial face thereof.

4,466,284

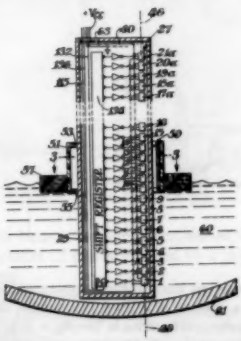
FINE RESOLUTION LIQUID LEVEL DETECTOR

Stefaan D. Dumery, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 29, 1982, Ser. No. 363,183

Int. Cl.³ G01F *23/12*

U.S. Cl. 73—313 7 Claims



1. A fine resolution liquid level detector comprising:

(a) a column of uniformly spaced Hall-sensors each of said Hall-sensors being capable of producing, at an output, one type electrical signal when in a magnetic field of one

polarity, and being capable of producing, at said output, another type electrical signal when in another polarity of magnetic field;

(b) a compound magnet assembly;

(c) means for holding said column vertically in a liquid;

(d) means for guiding said compound magnet assembly along and at a substantially fixed distance from said Hall-sensors column;

(e) means for keeping said compound magnet assembly at the surface of said liquid; and

(f) said compound magnet assembly being for producing at said column of Hall-sensors a fixed pattern of spaced apart magnetic field regions of said one polarity, a number n of said regions, designated vernier regions, each having a uniform center to center spacing b as measured along the axis of said column, b being unequal to a , wherein a is said uniform spacing of said Hall-sensors, and another one of said field regions, designated a main region, having a length d as measured along said axis that is greater than the spacing a.

4,466,285

UNDERWATER INSTRUMENT FOR THE COMBINED READING OF IMMERSION TIME AND DEPTH, AND DECOMPRESSION TIME

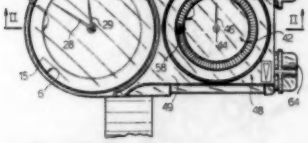
Emilio Allemano, Via Rosolino Pilo, 4, 10139 Torino, Italy

Filed Aug. 2, 1982, Ser. No. 404,098

Claims priority, application Italy, Sep. 25, 1981, 53632/81[U]

Int. Cl.³ G06G *5/00*; G01F *23/14*

U.S. Cl. 73—432 R **5 Claims**



1. An underwater instrument for the combined reading of immersion time and depth, and decompression time, comprising, in combination, a depthometer (5), a clock device (8), a support (10) for decompression tables, and a casing (2) on which said depthometer (5), clock device (8) and support (10) are mounted in mutually side-by-side positions so as to be simultaneously consultable, said support for said decompression table being housed in said casing (2), and comprising a flexible band (10), and two drums (11,12) rotatably mounted in said casing (2), the opposing ends of said band (10) being wound in opposite directions about said two drums (11,12).

4,466,286

SCANNER FOR SCANNING AN OBJECT BY MEANS OF ULTRASONIC RADIATION

Hubertus J. Berbeé, Rozenburg; Hendrik J. Voute, Nootdorp, and Johannes M. Thijssen, Nijmegen, all of Netherlands, assignors to N.V. Optische Industrie "de Oude Delft", Netherlands

Filed Mar. 31, 1982, Ser. No. 363,908

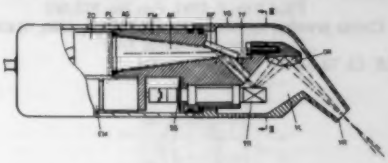
Claims priority, application Netherlands, Apr. 8, 1981, 8101744

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—629 **20 Claims**

1. An ultrasonic scanner comprising:

a housing; one or more movable reflector means positioned within said housing; transducer means mounted within said housing and positioned to direct a beam of ultrasonic waves towards the surface of one of said movable reflector means; means for conducting said beam of ultrasonic waves; object reflector means mounted within said housing and positioned to receive ultrasonic waves reflected from said movable reflector means; first focussing means within said housing and adapted to converge said beam of ultrasonic waves to a first point within said housing at a preselected short distance from the one of said movable reflector means which receives the beam of ultrasonic waves, said object reflector means comprising a second



focussing means for forming a second focus of said beam of ultrasonic waves within an object being scanned support means for supporting said movable reflector means, and for causing said movable refector means to traverse an arcuate path with respect to said object reflector means, whereby a beam of ultrasonic waves focussed within the object by said second focussing means performs a scanning motion in response to movement of said movable reflector means

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4,466,287

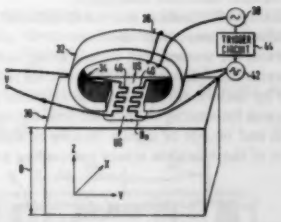
NON-DESTRUCTIVE, NON-CONTACT ULTRASONIC MATERIAL

Wilhelm Repplinger, Dillingen; Gerhard Hübschen, Saarlouis, and Hans-Jürgen J. Salzburger, Neunkirchen, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,310

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—643 **9 Claims**



1. A method for non-contact, non-destructive testing of a test body of ferromagnetic and/or electrically-conductive material with ultrasound waves, comprising the steps of:

(a) producing in a near-surface region of the test body a low-frequency alternating magnetic bias field having flux lines generally parallel to a surface of the test body;

(b) producing high frequency alternating magnetic excitation fields in said near-surface region generally parallel to said surface during a time interval when the bias field is at a quasi-static maximum, adjacent excitation fields having opposing polarity and having flux lines lying in mutually parallel directions, whereby ultrasound waves are generated in the test body; and

(c) detecting high frequency alternating magnetic fields in said near-surface region during the same time interval when the bias field is at a quasi-static maximum and pro-

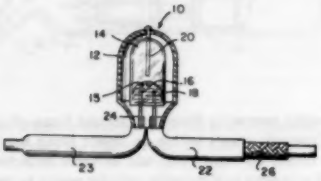
ducing a signal therefrom representative of said ultrasound waves.

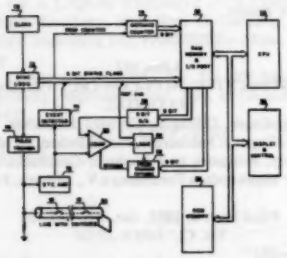
4,466,288

APPARATUS FOR SENSING AND LOCATING VIBRATIONS

Ami Grynberg, Neve Monoson; Abraham Peristein, and Edward Gliksman, both of Tel Aviv, all of Israel, assignors to Israel Aircraft Industries Ltd., Ben Gurion Airport, Israel

Filed Nov. 5, 1981, Ser. No. 318,562
Claims priority, application Israel, Nov. 9, 1980, 61438
Int. Cl.³ G01H *1/00*
U.S. Cl. 73—654 **13 Claims**





1. Vibration sensing and locating apparatus comprising:
an extended electrical conductor;
a plurality of vibration sensors distributed along said conductor and connected thereto;
apparatus for transmitting signals along said conductor;
apparatus for receiving signals reflected along said conductor by said vibration sensors in response to events; and
apparatus for sensing the elapsed time between the transmission and receipt of signals thereby to determine the location of the vibration sensor responding to an event.

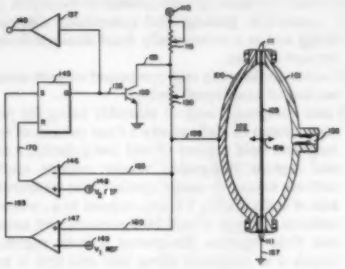
4,466,289

CAPACITANCE MANOMETER WITH DIGITAL OUTPUT

Calvin K. Lam, 77 Wallace Rd., R.F.D. 9, Bedford, N.H. 03102

Filed Mar. 17, 1982, Ser. No. 358,854
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—724 **7 Claims**

1. A capacitance manometer comprising:
a vacuum or pressure transducer for converting relative changes in vacuum or pressure values into relative changes in transducer capacitance; and
means responsive to the electrical voltage across said transducer capacitance for producing a first signal when said voltage equals a first value;
means responsive to the electrical voltage across said transducer capacitance for producing a second signal when said voltage equals a second value;
means responsive to said first signal for electrically charging said transducer capacitance and responsive to said second signal for electrically discharging said transducer capacitance; and



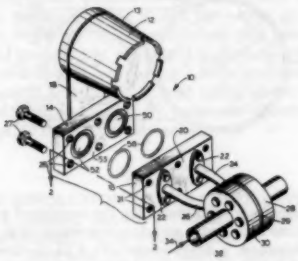
means responsive to said first and second signals for producing an output frequency signal proportionally related to the value of said transducer capacitance.

4,466,290

APPARATUS FOR CONVEYING FLUID PRESSURES TO A DIFFERENTIAL PRESSURE TRANSDUCER

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Nov. 27, 1981, Ser. No. 325,342
Int. Cl.³ G01L *7/08, 9/12*
U.S. Cl. 73—756 **16 Claims**



1. A differential pressure transducer having a single coupling body defining body face surface means; separate first and second pressure inlets extending through the coupling body from a differential pressure sensor element and both inlets opening through the face surface means; first and second flexible isolation diaphragm means overlying the openings of the respective first and second inlets and being sealed to the coupling body at rim portions surrounding the openings of the inlets, respectively, to isolate the inlets from external fluids, the isolation diaphragms both facing in the same direction outwardly from the coupling body for receiving fluid under pressure from first and second sources of fluid, the difference in pressure of which is to be measured; a flange for carrying fluid pressure from such sources to the isolation diaphragms comprising a single massive body having first and second faces; first and second fluid passageways defined through the flange, each such passageway extending from the first face to the second face, the flange including means for coupling the first ends of the passageways to first and second sources of fluid under pressure, second ends of the passageways opening to the second face of the flange at separate locations, the flange being configured so the second face is complementary in configuration to the body face surface means and sealingly mates with the face surface means of the coupling body of the differential pressure transducer to simultaneously couple each passageway

in the flange to a respective isolation diaphragm; means to convey fluid pressures acting on the isolation diaphragms to an associated differential pressure sensor element; each such fluid passageway being adapted to separately convey fluid under pressure to one of the isolation diaphragms of the differential pressure transducer when the flange passageways are connected to sources of fluid under pressure to be measured.

4,466,291

EXTENSOMETER

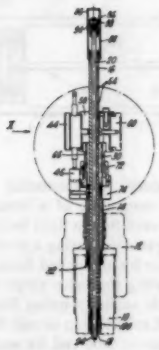
Arthur D. Forster, Blaydon, and James S. Mitchell, Newcastle Upon Tyne, both of England, assignors to Northern Engineering Industries plc, Newcastle Upon Tyne, England

Filed Aug. 26, 1982, Ser. No. 411,376

Claims priority, application United Kingdom, Sep. 30, 1981, 8129561

Int. Cl.³ F16B *31/02*

U.S. Cl. 73—761 12 Claims



1. An extensometer comprising:

(a) first and second members mutually restrained so as to be capable of relative movement only along a rectilinear axis;

(b) first and second abutment formations defined on said first and second members, respectively, said first and second abutment formations facing in opposite directions along said axis;

(c) a spring arranged in relation to said members so as to be stressed by relative movement of said members;

(d) indicator means which co-operate with said members to indicate the extent of said relative movement; and

(e) a third member;

(f) one of said abutment formations being on resilient fingers which extend lengthwise in relation to said axis, which are disposed about said axis and which are in sliding engagement with said third member, said fingers being displaceable transversely of said axis to a position in which said fingers are relatively strained by relative movement along said axis between said fingers and said third member, reverse relative movement along said axis between said fingers and said third member allowing said fingers to return to a position in which said fingers are relatively unstrained.

4,466,292

PROCESS AND APPARATUS FOR MEASURING THE COACTION TENSILE STRESS IN RIVETED JOINTS

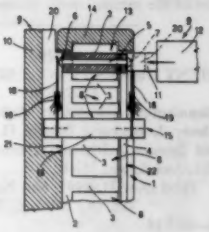
Giuseppe Milazzo, Scandicci, Italy, assignor to Riv-SKF Officine Di Villar Perosa S.p.A., Turin, Italy

Filed May 10, 1982, Ser. No. 376,561

Claims priority, application Italy, Mar. 11, 1980, 9575 A/80

Int. Cl.³ G01L *1/04*

U.S. Cl. 73—789 8 Claims



1. A process for measuring the mechanical tension of a rivet (5) connecting to one another at least two pieces (2,4) facing and held in contact with each other by the rivet, comprising the following steps:

positioning one of the two pieces (2) against a stop member (10) and positioning a pressure member (11), in alignment with said stop member (10), and against the other of said two pieces (4), so that pressure member (11) and said stop member (10) may be moved toward one another;

moving said stop member (10) of said pressure member (11) toward one another so as to compress said two pieces (2,4) against one another with a predetermined force in order to produce in them an elastic deformation; and

measuring the variation of the length of said rivet (5) as a result of the compression stress induced into said two pieces (2,4) by the mutual approaching of said stop member and said pressure member (10,11).

4,466,293

VOLUME FLOW METER FOR A FLOWING MEDIUM

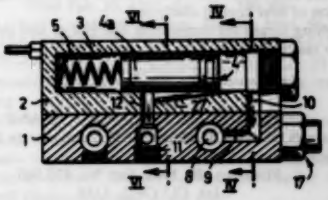
Teuvo T. Huhtala, Muurame, Finland, assignor to Oy Safematic Ltd., Muurame, Finland

Filed Jul. 15, 1982, Ser. No. 398,714

Claims priority, application Finland, Jul. 20, 1981, 812265

Int. Cl.³ G01F *1/22*

U.S. Cl. 73—861.54 8 Claims



1. A volume flow meter for the measurement of the flow quantity of a flowing medium, especially of a liquid, which meter comprises a cylindrical measurement channel, to which channel are connected an inlet point and an outlet point for passing the medium to be measured through the measurement channel, an indicator piston moving axially in the measurement channel, which piston is shifted by the medium flowing from an inlet channel to the measurement channel into different axial positions depending on the flow quantities, and an axial flow

slot in communication along its length with the measurement channel, the size of the said slot being affected by the axial position of the indicator piston, characterized by means for cleaning the measurement channel by forcing the indicator piston toward the inlet point, said means including a reversing valve which guides the medium to be measured optionally to the inlet point of the measurement channel or, via a by-passing channel, to the opposite side of the indicator piston in the measurement channel, as seen from the inlet point, and the indicator piston having a flow connection from said opposite side of the measurement channel to the inlet-point side and to the flow slot of the measurement channel.

4,466,294

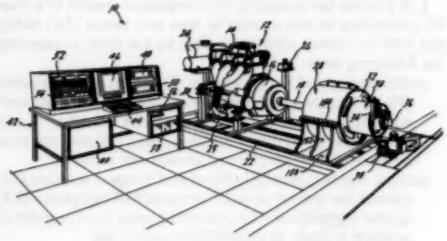
TRANSIENT DRIVING CYCLE SIMULATOR TEST SYSTEM

James E. Bennington, Ann Arbor; Michael J. Boerma, Pinckney; Anthony J. Brakora; Donald H. Locker, both of Ann Arbor, and Terence J. Rhoades, Dexter, all of Mich., assignors to EDI, Ann Arbor, Mich.

Filed Dec. 31, 1981, Ser. No. 336,069

Int. Cl.³ G01L *3/18*

U.S. Cl. 73—862.13 **9 Claims**



1. An inertia wheel assembly for simulating vehicle acceleration and deceleration horsepower requirements for a prime mover in a transient driving cycle simulator test system comprising:

a generally cylindrical housing having a base structure, a bottom half section fixedly secured to said base structure and a top section detachably secured to said bottom half section;

a central shaft rotatably mounted to said housing and extending therethrough;

at least one flywheel coaxially mounted on said central shaft such that said flywheel will rotate therewith;

a pair of disc brakes mounted to said housing in association with said central shaft for selectively retarding the rotation of said central shaft; and

coupling means for connecting one end of said central shaft to said prime mover.

4,466,295

PHOTOELASTIC SENSING MEANS

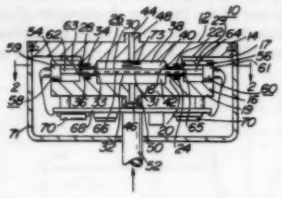
Laurence N. Wesson, Collegeville, Pa., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 20, 1982, Ser. No. 420,003

Int. Cl.³ G01L *1/24*

U.S. Cl. 73—862.38 **44 Claims**

1. A photoelastic sensing means comprising a thin photoelastic member of transparent material having closely spaced top and bottom outer surfaces with peripheral edges and an edge surface extending between the peripheral edges of the outer surfaces, first means for providing light flux to the edge surface of the member for being transmitted by the member as polarized light flux along a path therethrough, the spacing between the top and bottom outer surfaces of the member being relatively small compared to the length of the path of the polarized light flux in the member, second means for receiving and detecting light flux transmitted by the member and providing an output signal, and third means supporting the member to produce therein bending stress in a direction transverse to the



path of the light flux in the member with application of force to the member, the output signal of the second means being responsive to the force producing the stress in the member.

4,466,296

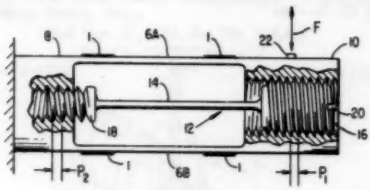
FORCE TRANSDUCER RANGE ADJUSTER

Marion A. Keyes, IV, Chagrin Falls, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 2, 1982, Ser. No. 394,956

Int. Cl.³ G01L *1/22*

U.S. Cl. 73—862.52 **4 Claims**



1. In a force transducer for generating an output signal corresponding to the magnitude of a force having a force receiving base cantilevered from a fixed base through a spring flexure having a spring rate producing a given displacement of the force receiving base by an applied force of given magnitude, means for expanding the force range of the transducer comprising a removable auxiliary spring flexure spaced from but disposed in parallel relationship to said first spring flexure and having thread means at each end for anchoring the opposite ends of said auxiliary spring flexure in said fixed and force receiving bases respectively whereby the displacement of the force receiving base is substantially the same as for said given displacement for an applied force of greater magnitude than said first applied force.

4,466,297

DEVICE FOR MEASURING A FORCE

Hans W. Häfner, Aichach, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,169

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212099

Int. Cl.³ G01L *1/04*

U.S. Cl. 73—862.64 **18 Claims**

13. A device for measuring a force comprising:

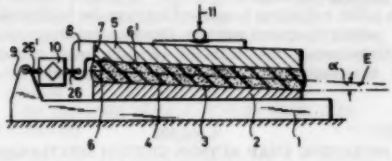
a generally horizontal base element;

at least two functional elements disposed above said base element, a first of said functional elements being rigidly connected to said base element and a second of said functional elements being displacably mounted relative to said first functional element, said device exhibiting a force resolving plane inclined relative to the direction of said force and said first and second functional elements each

having respective surfaces in or parallel to said resolving plane;

a force measuring means interconnected between said second functional element and said base element for measuring displacement of said second functional element substantially independently of the path of said displacement; and

an elastically effective intermediate layer disposed between said surfaces of said functional elements.



4,466,298

THERMAL EXPANSION RESISTANT PIPETTE

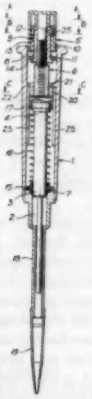
Jukka Tervamäki, Helsinki; Erkki Kaski, Luvia; Mikael Fagerstedt, and Aarre Kukka, both of Helsinki, all of Finland, assignors to Labsystems Oy, Helsinki, Finland

Filed Jun. 8, 1982, Ser. No. 386,269

Claims priority, application Finland, Jun. 17, 1981, 811915

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.18 9 Claims



1. An improved pipette comprising:

(a) a hollow frame portion forming a handle, said frame portion including an upper opening and an inner surface at its upper end;

(b) a cylinder formed within said frame portion;

(c) a piston displaceably and sealably fitted within said cylinder;

(d) a piston rod coupled to said piston for displacing same;

(e) a threaded shaft disposed within said frame including an upper portion and a lower portion, the lower portion of said shaft engaging said piston rod to displace same;

(f) a calibration sleeve threaded to the upper portion of said threaded shaft to permit the total length of said sleeve and said threaded shaft to be adjusted by relative relation thereof to thereby determine the lower limit of displacement of said piston; and

(g) a hollow press knob coupled for displacement with said threaded shaft and extending out of said upper opening in said frame, said press knob including depending side walls forming a mantle, at least a portion of said calibration sleeve extending within said mantle of said press knob and being spaced apart from said mantle and said inner surface of said frame portion, the hollow press knob and the pipette frame forming a cover protecting said calibration sleeve from conducted heat by forming an air space about said sleeve.

4,466,299

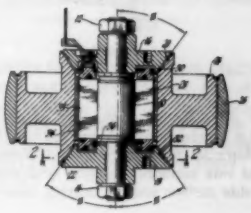
GYRO BEARING ASSEMBLY

James J. Mross, South Milwaukee; Howard F. Traeder, and Robert M. Seidl, both of Milwaukee, all of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1964, Ser. No. 413,265

Int. Cl.³ G01C *19/06*

U.S. Cl. 74—5.7 8 Claims



1. Gyroscopic apparatus comprising the assembly of a solid stator shaft having an enlarged central section defining two axially spaced shoulders, support means mounted on the stator shaft a predetermined axial distance apart and abutting said shoulders, each of the support means defining an outer frustoconical bearing surface opening outwardly from the assembly, a rotor wheel having an axial bore through which the stator extends, the wheel having formed at each end of the axial bore and inner frustoconical bearing surface disposed in cooperative relation with and spaced from the adjacent bearing surface of the stator shaft to define a bearing gap, a fluid filling the gaps, hydrodynamic pressure generating configurations formed on each of the rotor bearing surfaces including a plurality of sectors each of which includes a groove-pocket-land combination, the ratio of the arc lengths of the land and pocket being approximately two, and drive means for rotating the rotor wheel about the stator shaft.

4,466,300

SPEEDOMETER DRIVE GEAR ARRANGEMENT IN TRANSAXLE

Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 19, 1982, Ser. No. 350,386

Claims priority, application Japan, Feb. 20, 1981, 56-22886

Int. Cl.³ F16H *37/00, 1/38;* G01P *3/00;* B21D *53/28*

U.S. Cl. 74—12 10 Claims

9. A speedometer drive gear arrangement in a transaxle, comprising:

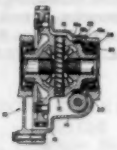
a. a differential case having a generally cylindrical wall portion;

b. a plastic worm gear mounted on said differential case and having an inward flange of a thickness smaller than an overall thickness of said worm gear;

c. means for interlocking said worm gear and said drive component so that the worm gear is axially movable but non-rotatable relative to the differential case; and

d. means for locating said worm gear axially in place relative to the differential case by engaging said inward flange at opposed side surfaces thereof with the differential case, said locating means including a shoulder formed in the differential case at one axial end of said cylindrical wall portion, one of said inward flange side surfaces abuttingly engaging said shoulder; a bearing having an inner race and

rotatably supporting said differential case within said transaxle; and a stopper interposed between said worm gear and said bearing in a manner to abuttingly engage the other inward flange side surface with said inner race of said bearing, wherein said stopper is a thin, generally flat



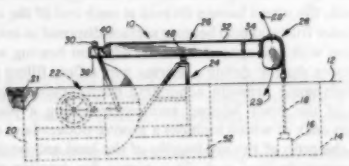
annular plate having a plurality of integral fingers arranged in a circular array to engage said flange at an inner circumferential wall thereof, said stopper also having opposed side surfaces engaging with said other inward flange side surface and the bearing inner surface respectively.

4,466,301

LOW PROFILE PUMPJACK UNIT

Johnny E. Hill, 3215 Apperson, Midland, Tex. 79701

Filed Aug. 11, 1981, Ser. No. 291,925
Int. Cl.³ F04B 47/02
U.S. Cl. 74—41 **4 Claims**



1. In a low profile pumpjack unit for reciprocating a string of sucker rod connected to a downhole pump, said pumpjack unit includes a main frame which supports an upright Sampson post; a walking beam journaled to the Sampson post and rocked by a pitman arm connected at one end thereof, and a horsehead located at the other end thereof; and a bridle attached to the horsehead which is connected to reciprocate a poliah rod which extends through a stuffing box and reciprocates the sucker rod string, the improvement comprising:

said horsehead comprises two parallel vertically aligned spaced plate members which are mirror images of one another and of substantially identical geometrical configuration;

each plate member includes an outer curved track surface, an upper track surface, and a lower curved track surface;

said outer curved track surface is a segment of a circle having a radius measured from the Sampson post journal, said upper and lower track surfaces are joined to the outer curved track surface by a relatively sharp bend; the chord of the segment of a circle which forms said outer track member is slightly less than the stroke of the sucker rod;

a downwardly opening bridle receiving saddle located on the lower surface of the far end of the walking beam and adjacent to the near end of the plate members which form the horsehead, a bridle located on the track surface, said bridle has a medial length thereof received within the saddle and the remaining opposed marginal ends of the bridle are roved from the downwardly opening saddle, upwardly across the upper track member and back down the outer track member where the bridle ends are connected to a hanger bar, said hanger bar is closely spaced in underlying relationship respective to the lower side of the two spaced members;

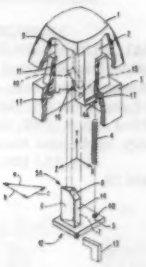
a polish rod clamp is received between the bridle ends and within the spaced members, thereby providing a minimum requirement for height between the lower end of the horsehead and the upper end of the polish rod.

4,466,302

NUTATING SNAP ACTION SWITCH MECHANISM

Richard H. Harris, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,234
Int. Cl.³ F16H 25/18
U.S. Cl. 74—100 R **5 Claims**



1. A snap action switch mechanism, comprising:

a housing having an opening;

a key stem slidably received within said opening with means on said key stem for limiting sliding;

a resilient biased spring means for biasing said key stem toward a position;

a rocker plate mechanism having a generally planar base, a generally centrally located pivot means on one side thereof and a generally upstanding first cam member affixed to the opposite side of said planar base at a position not colinear with said pivot, and means for mounting one end of said resilient biased spring means on the surface opposite the surface having said pivot;

said rocker mechanism and said key stem being generally coaxially arranged in said housing with said resilient biased spring means positioned therebetween and tending to bias said rocker and key stem in opposite directions and to bias said rocker eccentrically in a given direction about said pivot;

a second cam member on said key stem positoned to contact said cam member on said rocker plate;

said first and second cam members being configured to impart motions to said rocker mechanism when said key stem is depressed against the urging of said resilient biased spring means, said motions being to first rock said mechanism in a first axis about said pivot and, with continued depression of said key stem, to cause a sudden transfer of engagement of said first and second cam members and to allow a sudden spring urged snap motion of rocking in a second axis about said pivot; and

upon release of depression of said key stem, said cam members and spring causing a sudden snap motion restoration of engagement of the surfaces originally engaged at the start of said depression of said key stem, said restoration producing a rocking in a third axis about said pivot and restoring said rocker mechanism to its original starting positions.

4,466,303

INFINITELY VARIABLE FRICTION-CONE TRANSMISSION WITH MOVABLE FLANGE-MOUNTED MOTOR

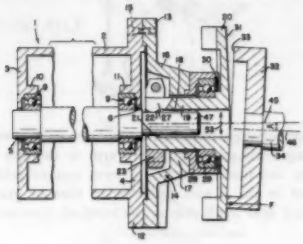
Bernd Stöber, Pforzheim, Fed. Rep. of Germany, assignor to Gebr. Stöber, Pforzheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 084,417, Oct. 12, 1979, abandoned. This application Feb. 12, 1982, Ser. No. 348,253

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844414

Int. Cl.[3] F16H *15/16, 1/12, 1/20;* H02K *7/10*

U.S. Cl. 74—191 9 Claims



1. A transmission arrangement, comprising:

a motor having a housing-flange and a motor shaft;

an infinitely variable friction-cone transmission having a friction-cone member including a hollow hub mounted on said motor shaft;

an anti-friction bearing adapted to resist rigidly any radially and axially directed loads and in operative contact with said hub and said housing-flange at that end of said hub remote from said motor; and

means for connecting to said motor shaft in an articulated manner to that end of said hub which is closest to said motor in such a way so as to avoid triple mounting the motor shaft journally and to accommodate and equalize pitching momentum including tilting or tipping forces acting on said friction-cone member, making said hub quasi-pivotal on said motor shaft and also making possible transmittal of any axial and radial forces encountered during operation of said infinitely variable friction-cone transmission into said housing flange thereby to relieve and unburden said motor shaft.

4,466,304

POWER TRANSMISSION

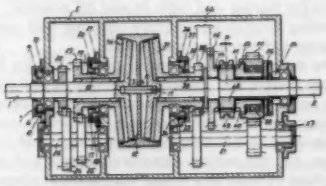
Hans Gött; Josef Ritter; Gerhard Ritter, and Klaus Ritter, all of Graz, Austria, assignors to EVG Entwicklungs-und Verwertungs-Gesellschaft m.b.H, Graz, Austria

Filed Jul. 14, 1982, Ser. No. 398,286

Claims priority, application Austria, Jul. 31, 1981, 3382/81

Int. Cl.[3] F16H *3/22;* F16D *21/02*

U.S. Cl. 74—346 7 Claims



1. A power transmission having first and second pairs of coaxial shafts which are aligned with one another and have ends adjacent to one another, means mounting said shafts for displacement relatively to one another in the axial direction, a control for controlling such displacement, a coupling disc arranged upon each of said adjacent shaft ends, and a central coupling body supported to be freely displaceable and rotatable between said coupling discs for coupling said shafts together in selectable combinations, wherein said first pair of coaxial shafts consists of a driving shaft and a hollow shaft surrounding said driving shaft, said first pair of coaxial shafts being connected together via a gear wheel on each of said first pair of coaxial shafts and a back gear in a first predetermined fixed transmission ratio, and wherein said second pair of coaxial shafts consists of a driven shaft and a second hollow shaft surrounding said driven shaft, said second hollow shaft being connected via a third gear wheel and a second back gear to a fourth gear wheel which is adapted to be coupled to said driven shaft in a second predetermined fixed transmission ratio.

4,466,305

REVERSE IDLER GEAR OPERATING MECHANISM

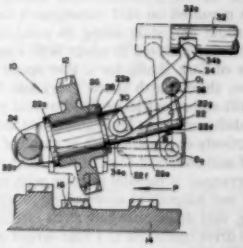
Kazuyoshi Hiraiwa, and Yoshiyuki Fukuda, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed May 18, 1982, Ser. No. 379,509

Claims priority, application Japan, May 19, 1981, 56-74096

Int. Cl.[3] B60K *20/00;* F16H *35/00*

U.S. Cl. 74—473 R 1 Claim



1. A reverse idler gear operating mechanism in an automobile manual transmission comprising:

a driving reverse gear mounted on a shaft for rotation therewith but against axial movement relative thereto;

a driven reverse gear mounted on a mainshaft for rotation therewith but against axial movement relative thereto, said mainshaft being arranged generally parallel to said driving reverse gear shaft;

a reverse idler gear located between said driving and driven reverse gears and engageable therewith to reverse the drive line;

a reverse idler shaft pivotally mounted at one end thereof on a pivot shaft, said pivot shaft extending substantially at right angles to said driving reverse gear shaft and said mainshaft and fixedly attached to a transmission case, said reverse idler shaft being moveable about said pivot shaft between a first angular position where it extends generally parallel to said driving reverse gear shaft and said mainshaft to allow said reverse idler gear to engage the driving and driven reverse gears and a second position where it is inclined relative to said driving reverse gear shaft and said mainshaft to allow the former to be disengaged from the latter;

said reverse idler shaft having at the other end portion thereof an axially elongated opening;

a shifter pivotally mounted at a location intermediate opposed first and second ends thereof on a pivot shaft which extends in parallel with the first-mentioned pivot shaft and fixedly attached to the transmission case, said shifter having at said first end a sliding pin slidably received in said elongated opening; and

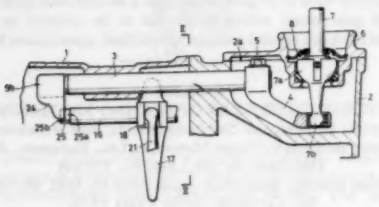
an axially slidable rod having a notch with which said second end of said shifter is engaged.

4,466,306

MECHANISM FOR PREVENTING MISOPERATION IN A MANUAL TRANSMISSION

Nobuaki Katayma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 30, 1982, Ser. No. 403,803
Claims priority, application Japan, Aug. 26, 1981, 56-134640
Int. Cl.³ G05G *5/10*; B60K *17/34*
U.S. Cl. 74—477 **2 Claims**



1. In combination with a manual transmission for an automotive vehicle having a transmission casing, a shift-and-select lever shaft mounted on said transmission casing and effective to rotate about and slide along its axis, said shift-and-select lever shaft being adapted to coact with a speed change lever, shift heads of fork shafts for a low speed gear, first-second speed gears, third-fourth speed gears and fifth-reverse speed gears, a shift-and-select lever fixed to and projecting laterally from said shift-and-select lever shaft, said shift-and-select lever being selectively engagable with any one of said shift heads by rotation of said shift-and-select lever shaft and a drive changing shaft arranged in parallel relation with said shift-and-select lever shaft and adapted to move along its axis in said transmission casing, said drive changing shaft effecting change from a two-wheel drive operation to a four-wheel drive operation and vice versa by its axial movement; a mechanism for preventing misoperation in a manual transmission comprising a stopper arm projecting laterally from said shift-and-select lever shaft and a stopper surface formed on one end of said drive changing shaft, said stopper surface being in abutment against said stopper arm under the condition that said shift-and-select lever is engaged with said shift head for the first-second speed gears to prevent said shift-and-select lever from rotating toward said shift head for the low speed gear in the two-wheel drive operation.

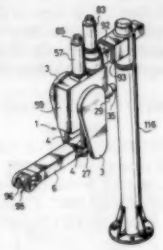
4,466,307

INDUSTRIAL ROBOT

Toshio Kouno, Tokyo, Japan, assignor to Dainichi Kiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,532
Claims priority, application Japan, Sep. 14, 1980, 55-127644
Int. Cl.³ B25J *3/02*; G05G *1/04*
U.S. Cl. 74—479 **7 Claims**

1. An industrial robot comprising a body mounted on a supporting base for rotation about a θ-axis, means located in said body for reciprocable movement in a horizontal X-axis, and means located in said body for reciprocable movement in a vertical Z-axis, a pair of depending upper arms each pivotably mounted at one end to said means for movement in the X-axis, a work arm pivotally secured at its rear end to said upper depending arms, and extending parallel to said X-axis, a pair of rods each pivotally mounted at one end to said means for movement in the Z-axis and pivotally connected at the other end to said work arm intermediate its ends, a pair of straight links pivotally connected at one end co-axially with the pivot connection of said rods with the means for movement in said Z-axis and at the other end to said depending arms in line with the pivotal connection of said depending means with the means for movement in the X-axis and with the pivotal connection to said work arm, each of said links being arranged parallel to the axis of said work arm and having a length equal



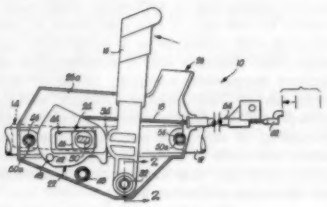
to the distance between the pivot connection of said rods and said depending arms with said work arm to thereby form a parallelogram, and means exerting a force against said means for movement in the Z-axis opposite to that of gravity to thereby balance said work arm in the vertical direction.

4,466,308

CONTROL ASSEMBLY FOR LAWNMOWER HAVING ELECTRICALLY STARTED ENGINE

Bruce J. Kester; Arthur L. Urban, and Dale C. Kester, all of Wichita, Kans., assignors to Conchemco, Incorporated, Lenexa, Kans.

Filed Jun. 16, 1982, Ser. No. 388,898
Int. Cl.³ G05G *11/00*; A01D *75/28*; B60K *41/20*
U.S. Cl. 74—483 R **7 Claims**



1. A power lawnmower control apparatus for engaging an electric ignition assembly having off, on and start positions, comprising:

shiftable handle means;

moveable operating means;

cable means adapted for operative connection to said ignition assembly and shiftable between positions corresponding to said off, on and start position of said ignition assembly;

means for biasing said cable to said off position;

operating mechanism operably coupling said cable, handle means and operating means; and

means mounting said operating mechanism for first movement thereof and consequent shifting of said cable to said on position thereof, in response to shifting of said handle means, for releasably retaining said cable in said on position while said handle means remains in said shifted position, and for second movement thereof and consequent shifting of said cable to said start position when said cable is in said on position and said mechanism is moveably engaged by said operating means, said mounting means comprising a pivotally mounted, non-circular guide;

said operating mechanism including structure defining an elongated guide-receiving slot, said guide being engaged

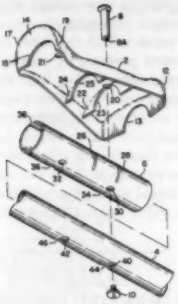
by said slot so as to permit shifting of said operating mechanism to said start position when said mechanism is in said on position and to inhibit shifting of said mechanism to said start position when said mechanism is in a position other than said on position.

4,466,309

ADJUSTABLY POSITIONED HANDGRIP FOR AMBULATORY AIDS

Edward J. Matey, Sussex, N.J., assignor to Maddak, Inc., Pequannock, N.J.

Filed Apr. 5, 1982, Ser. No. 365,567
Int. Cl.³ B62K *21/26*
U.S. Cl. 74—551.9 **6 Claims**



1. A handgrip for gripping an ambulatory aid member and the like, comprising:

an elongated rigid, substantially concave shell which is longitudinally and transversely contoured for gripping, whereby a user's gripping hand is relatively open, said shell having opposite ends separated by an intermediate section and having openings therein which are aligned with each other, said ends and intermediate section cooperating for providing an external cradle for the gripping hand to minimize sliding thereof away from and off the shell, and for providing an internal channel for the ambulatory aid member;

a pair of holes carried by the shell in longitudinally spaced relation;

the ambulatory aid member carrying at least first and second pairs of holes, the holes in each pair being in longitudinally spaced relation corresponding to that of the shell holes and each pair of ambulatory aid member holes being angularly displaced from the other pair;

the shell being angularly displaced relative to the ambulatory aid member for selectively aligning one of the pairs of ambulatory aid member holes with the pair of shell holes, the shell having at least two internal ribs in spaced relation along the length thereof, said ribs having openings which are aligned with the openings in the opposite ends of the shell, said openings in the opposite shell ends and in the internal ribs cooperating to provide the internal channel for receiving the ambulatory aid member;

means for engaging the aligned holes to secure the shell to the ambulatory aid member;

an adapter which fits over the ambulatory aid member and into a channel formed by the openings in the internal ribs, said adapter carrying at least third and fourth pairs of holes, the holes in each of said pairs corresponding in longitudinally spaced relation to the shell holes and the ambulatory aid member holes, and each of the pairs of adapter holes corresponding in angular displacement to that of the pairs of ambulatory aid member holes;

the pairs of adapter holes being aligned with corresponding pairs of ambulatory air member holes and the shell being angularly displaced for selectively aligning one of the pairs of ambulatory air member holes and a corresponding pair of adapter holes with the pair of shell holes;

the engaging means engaging the aligned shell, ambulatory aid member and adapter holes to secure the adapter, ambulatory aid member and shell to each other;

the adapter having at least two transverse slots corresponding in spaced relation along the length thereof to the spaced relation of the internal shell ribs; and

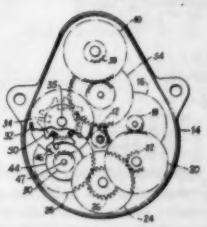
the ribs engaging the adapter slots when the adapter fits over the ambulatory aid member and into the channel formed by the openings in the internal ribs.

4,466,310

TIMING MECHANISM WITH TWO INDEPENDENT ROTARY OUTPUTS

Roger D. Rulseh, New Holstein, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 235,285, Feb. 17, 1981, , which is a continuation of Ser. No. 69,032, Aug. 29, 1979, abandoned. This application Apr. 18, 1983, Ser. No. 484,013
Int. Cl.³ F16H *37/06*; H01H *3/00*
U.S. Cl. 74—665 GA **5 Claims**



1. A timing means having a first cycle output continuously rotating at a predetermined number of revolutions per unit time and a second timing cycle output intermittently rotating at a greater number of revolutions per unit time than said first output and providing a timing segment for a portion of each revolution of said second output a predetermined number of times during each revolution of said first timing cycle output comprising:

a single input shaft arranged to be continuously rotated;

a plurality of gears each having a pinion attached thereto;

said gears and pinions driven by said single input shaft and being interconnected in series to thereby form a speed reducing gear train having a single input shaft at one end adapted to be continuously rotated and providing said first timing cycle output rotating at a lower speed than said input;

each of said gears of said gear train rotating at a greater speed than the next successive gear;

a Geneva driver gear connected to and continuously rotated with one of said gears and its respective pinion intermediate the ends of said gear train, said Geneva driver gear and its associated gear and pinion all driven by a single input pinion;

an axial pin carrying the gear and pinion next successive to said one of said gears in freely rotatable relationship on said axial pin;

a Geneva follower gear affixed to said axial pin and operatively coupled to said Geneva driver gear for intermittent rotary motion comprising a plurality of incremental angular movements separated from one another by stop periods;

timing cam means connected to and rotatable with said Geneva follower gear providing a second timing cycle having a faster period than the first timing cycle and having a timing segment thereon; and

said timing segment providing a timing period during each second timing cycle that is shorter in duration than the

time duration of an incremental angular movement of the Geneva follower gear.

4,466,311

SLIP CONTROL SYSTEM FOR A CLUTCH

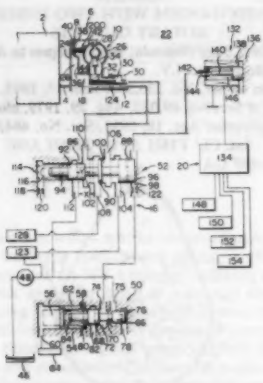
Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 288,105

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.³ B60K *41/18, 41/16*

U.S. Cl. 74—866 **6 Claims**



1. A torque transmitting system comprising a drive shaft rotating with torsional vibration, an output shaft, a friction clutch unit interposed between said drive shaft and said output shaft, fluid pressure-operated actuating means for causing engagement and disengagement of said friction clutch unit, means for detecting vibration occurring in a drive power system for transmitting torque to said output shaft from said drive shaft, and fluid pressure control means for controlling the pressure of actuating fluid supplied to said fluid pressure-operated actuating means on the basis of the output signal from said vibration detecting means thereby adjusting the difference between the rotation speed of said drive shaft and that of said output shaft.

4,466,312

SYSTEM FOR CONTROLLING TRANSMISSION RATIO OF TRANSMISSION FOR AUTOMOTIVE VEHICLES

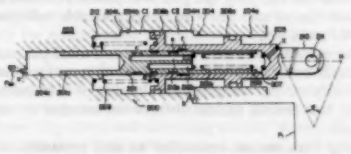
Tomio Oguma, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 27, 1981, Ser. No. 267,558

Claims priority, application Japan, May 27, 1980, 55-69615; Jun. 18, 1980, 55-81412

Int. Cl.³ B60K *41/04, 41/08;* **F16H** *15/08*

U.S. Cl. 74—868 **36 Claims**



1. A system for controlling the transmission ratio of an infinitely variable transmission for automotive vehicles including means for producing a line pressure, means for producing a pressure response to throttle opening, means for producing a pressure responsive to vehicle speed, means in the infinitely variable transmission for changing the transmission ratio thereof, and a valve for manually selecting the transmission ratio area, comprising:

servo means for controlling said transmission ratio changing means wherein the servo means further comprises a spool for controlling said servo means and which is operated in response to an input signal pressure thereon and controls the line pressure to be applied to drive the servo means;

kickdown valve means for generating an output signal pressure responsive to a throttle responsive pressure;

a modulator valve which is actuated by means of a vehicle speed responsive pressure applied against a spring force and the output signal pressure of said kickdown valve means exerted additionally to said spring force, the modulator valve regulating said vehicle speed responsive pressure into an output pressure;

a compensation valve which regulates the line pressure into a regulated output pressure by means of said output pressure of the modulator valve and the throttle opening responsive pressure exerted against said output pressure of the modulator valve, said regulated output pressure acting against the modulator valve output pressure in the compensation valve thereby providing said input signal pressure of the servo means; wherein said kickdown valve means output signal pressure is additionally exerted on the compensation valve against the modulator valve output pressure.

4,466,313

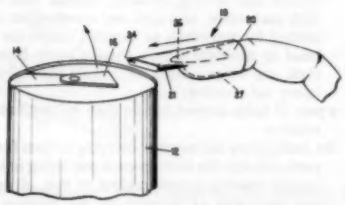
FINGER TIP OPERATED TAB TOP BEVERAGE CONTAINER OPENER

Timothy P. Gardner, 4060 S. Quarterline Rd., Muskegon, Mich. 49444

Filed May 2, 1983, Ser. No. 490,844

Int. Cl.³ B67B *7/40*

U.S. Cl. 81—3.46 R **5 Claims**



1. A finger tip operated tab top beverage container opener comprising a body having a finger tip opening in one end and a tab top opener at the other end, the finger tip opening being rounded and large enough to accommodate a finger tip, the tab top opener comprising a tab top prying member extending outwardly from the portion of the body housing the finger tip opening, the prying member having a pair of spaced sides that fit closely over and under the tab top such that the tab top can be opened by an upward rotational pressure exerted on the prying member by a finger tip inserted in the finger tip opening.

4,466,314

NONSLIP FASTENER TORQUING SYSTEM

Robert L. Rich, 13371 Lucille St., Garden Grove, Calif. 92644

Filed Dec. 14, 1981, Ser. No. 330,203

Int. Cl.³ B25B *13/00*

U.S. Cl. 81—90 C **11 Claims**

1. A fastener torquing system including:

a fastener having a head with:

female threaded engagement means including:

a threaded cavity defined in said fastener head; and

torque receiving means generally spaced about said female threaded engagement means, said torque receiving means including:

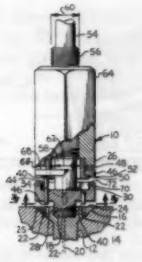
a plurality of cavities generally cylindrical in shape and generally parallel to said defined threaded cavity which pass through at least a portion of said fastener head; and

a tool having:

male threaded engagement means adapted to engage said female threaded engagement means including:

a screw sized and positioned to engage said threaded cavity, said screw having a longitudinal axis;

torque application means generally spaced about said male threaded engagement means and positioned to engage said torque receiving means when said male and female threaded engagement means are engaged, said torque application means including:



a plurality of pins generally cylindrical in shape and oriented generally parallel to said longitudinal axis of said screw and being positioned and sized to be placed in said plurality of cavities;

a pin plate to which said pins are fixedly attached, said pin plate being adapted to slide a limited distance along said longitudinal axis; and

a pin support disc positioned between said pin plate and said screw, said pin support disc being fixedly connected to said screw, forming a plurality of cylindrical cavities through which said pins are positioned, and having an abutment surface adapted to engage said fastener head; and

drive means to apply torque to said torque application means to thereby apply torque to said fastener.

4,466,315

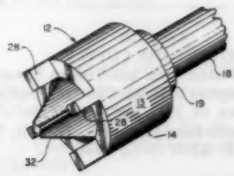
COMBINATION TOOL INCLUDING SPANNER WRENCH AND SCREWDRIVER

Benjamen J. Boschetto, Jr., 17685 Racoon Ct., Morgan Hill, Calif. 95037, and Timothy T. White, 1733 DeMarietta, #3, San Jose, Calif. 95126

Filed Aug. 26, 1982, Ser. No. 411,640

Int. Cl.³ B25B *15/00, 13/00*

U.S. Cl. 81—437 **7 Claims**



1. A combination tool comprising detachable spanner wrench and screwdriver portions,

(a) said spanner wrench portion including a cylindrical body having a pair of sockets formed in opposite ends and a plurality of spanner lugs projecting from one end of the body adjacent one of said sockets;

(b) said screwdriver portion including a screwdriver head detachably engaged in said socket associated with said spanner lugs and

(c) means provided in said spanner wrench portion adjustable to control the depth of engagement of said screwdriver head in said spanner wrench portion.

4,466,316

PHOTOGRAPHIC FILM TRAILING END CUTTING METHOD AND APPARATUS

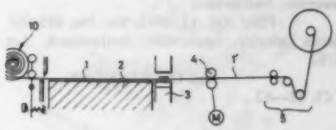
Kazuhiko Kobayashi; Eiichi Kito; Nobuo Watase, and Kaoru Uchiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1981, Ser. No. 316,028

Claims priority, application Japan, Oct. 31, 1980, 55-152190

Int. Cl.³ G03D *15/04*

U.S. Cl. 83—13 **6 Claims**



1. A method of cutting a photographic film wherein the film is pulled out of a cartridge and is transported past a cutting means and is cut by said cutting means, comprising the steps of:

utilizing tension which occurs in the film as the film is pulled out of the cartridge to generate a first detection signal which is transmitted to said cutting means;

detecting a length of said film transported past said cutting means;

generating a second detection signal and transmitting said second detection signal to said cutting means when said detected length is within a predetermined range;

enabling said cutting means which then cuts said film only in response to receipt of said first and second detection signals.

4,466,317

METHOD AND APPARATUS FOR SAFETY FOR PRESSES

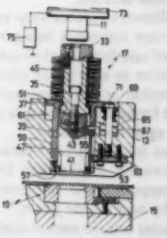
Nobuyuki Ikeda, Hatano, Japan, assignor to Amada Company Limited, Japan

Filed Aug. 12, 1982, Ser. No. 407,583

Claims priority, application Japan, Aug. 18, 1981, 56-128245

Int. Cl.³ B26D *7/24*

U.S. Cl. 83—55 **4 Claims**



1. A method of controlling the movement of a workpiece to be processed in a punch press, comprising the steps of:

moving the workpiece into an operative position in order to be processed by said punch press;

lowering the upper tool of said punch press by means of a ram in order to process said workpiece;

raising said ram after its lowering of said upper tool, thereby momentarily removing said ram out of contact with said upper tool;

detecting when said ram has returned to the proximity of the top dead center of its driving shaft;

detecting when the workpiece processing operation has been completed; and

moving the processed workpiece out of the operative position after detecting said upper tool contacting said ram, said ram has returned to the proximity of the top dead center of its driving shaft and the workpiece processing operation has been completed.

4,466,318

DRIVE SYSTEM FOR A CUTTING STATION IN A PLATEN PRESS

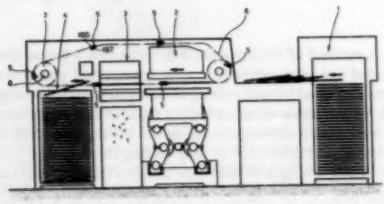
Gregor Schoch, Crissier, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed Apr. 11, 1983, Ser. No. 483,663

Claims priority, application Switzerland, Apr. 15, 1982, 2276/82

Int. Cl.³ B26D *5/00*

U.S. Cl. 83—62 **11 Claims**



1. In a platen press having a cutting station including a lower movable platen and an upper fixed platen, and a gripper bar means for transporting sheets through said press, a drive means for actuating said lower platen comprising:

four toggle joints interconnected between said lower platen and a fixed frame of said cutting station, said toggle joints being disposed in pairs and each pair of toggle joints being aligned on an axis perpendicular to the direction of sheet transport through said cutting station and one pair of toggle joints being disposed between the other pair, each toggle joint having two arms respectively connected by swivel means to said lower platen and said frame and having an axle pivotably connecting said arms;

a driveshaft connected to a drive means;

a camshaft in driving connection with said driveshaft carrying four cams thereon;

four cam followers respectively engaging said four cams, said four cam followers being respectively mounted on said axles of said four toggle joints for inclining said lower platen relative to said upper platen;

four compression springs respectively interconnected between said frame and said toggle joints for urging said cam followers against said cams;

pulling means interconnected between said frame and said lower platen for urging said lower platen toward said frame in opposition to movement of said lower platen imparted by said toggle joints;

two toggle joint release means contained in said frame each having a bearing receiving one of said swivel means of the toggle joints in one of said pairs of toggle joints for immediately retracting said one pair of toggle joints upon actuation of said toggle joint release means such that said pulling means pulls one end of said lower platen toward said frame;

a brake means operable on said driveshaft for automatic braking thereof; and

a hydraulic control means in hydraulic connection with said toggle joint release means and said brake means for simultaneous actuation thereof.

4,466,319

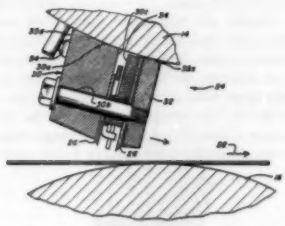
ROTARY CUTTING SYSTEM FOR A PRINTING PRESS

John Cogswell, Needham, and Robert F. Fokos, Wayland, both of Mass., assignors to Special Products Engineering Corporation, Needham, Mass.

Filed Dec. 29, 1981, Ser. No. 335,505

Int. Cl.³ B26D *1/56, 7/18*

U.S. Cl. 83—116 **12 Claims**



1. A rotary cutting system that makes at least one cut across a moving web with each rotation of the system comprising:

a rotatable knife cylinder,

a rotatable anvil cylinder,

said knife cylinder and anvil cylinder together defining a nip that receives said moving web,

at least one knife blade,

a knife blade holder that locates and supports said knife blade, said holder being located on the outer surface of the knife cylinder,

clamp means located on the opposite side of said blade from said blade holder,

spacer means disposed between said blade and said clamp means,

a perforator blade mounted with said spacer means and having laterally spaced apart sets of chisel-like teeth that project radially from said knife cylinder to impale a portion of said web adjacent said blade,

ejector means mounted for a radially reciprocating movement within said spacer means between a retracted position which is clear of said teeth and a raised position that removes said web portion from said teeth,

means for replaceably securing said knife blade, knife blade holder, spacer means, clamp means and perforator blade in a fixed, face-abutting, sandwich-like relationship, said securing means producing a gripping force oriented generally perpendicular to said abutting faces and said spacer means abutting said knife blade, and

means for securing said assembly to said knife cylinder.

4,466,320

ROTARY DIE CUTTER

Masateru Tokuno, Nishinomiya, and Tetsuya Sawada, Kyoto, both of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Oct. 19, 1982, Ser. No. 435,391

Claims priority, application Japan, Oct. 20, 1981, 56-169044

Int. Cl.³ B23D *25/12;* B26D *1/62*

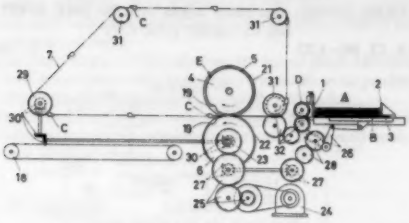
U.S. Cl. 83—325 **3 Claims**

1. A rotary die cutter for die-cutting blanks one after another into desired shape, said rotary die cutter comprising:

a blank feed means for feeding the blanks one after another for die-cutting,

a pair of cylinders for die-cutting the blanks when they pass therebetween, one cylinder having a die mounted thereon,

an endless member running synchronized with said cylinders,



a plurality of grippers mounted on said endless member at equal spacings for gripping the leading end of the blanks fed from said blank feed means, and

at least one of said cylinders having means to allow said grippers to pass between said cylinders.

4,466,321

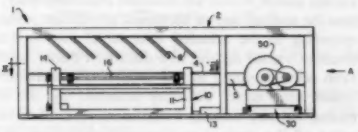
SCRAGG MILL

John H. Ferguson, Jr., 437 Avalon Dr., and Richard O. Angle, Rte. 1, P.O. Box 104, both of Rocky Mount, Va. 24151

Filed Jul. 28, 1982, Ser. No. 402,415

Int. Cl.³ B27B *7/00, 29/08*

U.S. Cl. 83—435.1 **12 Claims**



1. A scragg saw mill comprising:

(a) a pair of saw blades and means for rotationally driving same;

(b) a log carriage means for conveying a log between said saw blades; and

(c) a husk frame assembly for supporting said saw blades and the means for driving same and for shifting both of said saw blades laterally with respect to each other and said log carriage means in a manner adjusting the distance between each blade and the log carriage means by an equal amount;

wherein said husk frame assembly comprises a pair of husk frames in telescopingly interlocked relationship with each other and means for adjusting the telescopingly interlocked relationship of the husk frames for producing said shifting of the saw blades, each of said blades and the means for driving same being mounted upon a respective one of said husk frames.

4,466,322

PUNCH FOR OFFICE USE

Chuzo Mori, Katsushika, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 393,889

Int. Cl.³ B26F *1/02*

U.S. Cl. 83—468 **6 Claims**

1. A punch for office use comprising:

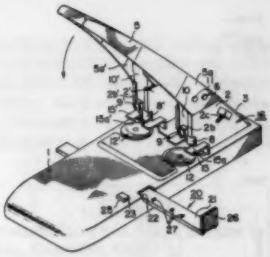
a base;

a pair of first and second hollow upright members on the base and spaced apart at a predetermined distance relative to each other, a part of the upright members defining a gap between the upright members and the base;

a handle supported on the upright members by first pins for rotation in a vertical plane relative to said base;

a pair of first and second movable blade supporting members in the first and second upright members, respectively, said blade supporting members being supported at their tops by second pins to the handle, so that the blade supporting members are movable through the gap toward the base in response to the vertical rotation of the handle;

a pair of hollow punching blades protruding from the lower sides of the pair of blade supporting members, each punching blade having a longitudinal axis deviating from the longitudinal axis of the corresponding blade supporting member so that a punching distance can be changed between first and second punching distances by interchanging the positions of the first and second blade supporting members in relation to the first and second upright members, said blades communicating through their upper ends with a pair of cavities, one end of each of said cavities being in the corresponding blade supporting member and the other end opening in the corresponding upright member so that waste paper is passed through the inside of each blade supporting member; and



a pair of supporting plates on the base at the lower position of the pair of punching blades, one face of each of said supporting plates cooperating with said punching blades at both the first and second punching distances in such a manner that said supporting plates receive the ends of the punching blades which move in response to the vertical rotation of a handle through the gap between the base and the upright members.

4,466,323

BLADE GUIDE FOR SAW BLADES

Krister Salomonsson, Lästad Säteri, S-342 00 Alvesta, Sweden

Filed Apr. 7, 1982, Ser. No. 366,448

Claims priority, application Sweden, Apr. 22, 1981, 8102557

Int. Cl.³ B27B *5/29*

U.S. Cl. 83—821 **6 Claims**

1. A blade guide for saw blades, comprising a number of small cemented carbide plates (2) which are moulded at intervals onto a base plate (1) of steel or the like by means of a metal (3) which is considerably softer than the carbide in the plates

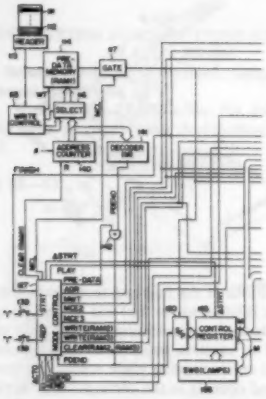
(2), said base plate having an upturned peripheral edge extending for substantially the thickness of the carbide plate thereby forming a dish-like structure, and said small cemented carbide plates being adjacent said base plate on the interior of the dished configuration.

4,466,324

AUTOMATIC PERFORMING APPARATUS OF ELECTRONIC MUSICAL INSTRUMENT

Eisaku Okamoto, Hamakita, and Kotaro Mizuno, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 24, 1981, Ser. No. 324,599
Claims priority, application Japan, Dec. 4, 1980, 55-171314
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 7 Claims



1. An automatic performing apparatus of an electronic musical instrument comprising:

first readout means for reading out of an external storage means musical performance data comprising pitch data and duration data of musical notes constituting music to be automatically played and control data comprising a plurality of data units each corresponding to a specific factor which constitutes a generation mode of musical tones of said music;

first memory means for storing the musical performance data read out of said external storage means;

second memory means for storing the control data read out of said external storage means;

second readout means for reading the musical performance data out of said first memory means at time intervals represented by the duration data of musical notes in the musical performance data;

musical tone signal generating circuit means coupled to said first memory means and responsive to the pitch data in the musical performance data to produce musical tone signals, said musical tone signal generating means including means responsive to the control data from said second memory means to control the generation mode of said musical tone signals;

switch circuit means having a plurality of manual switches each corresponding to the specific generation mode constituting factor controllable by said control data; and

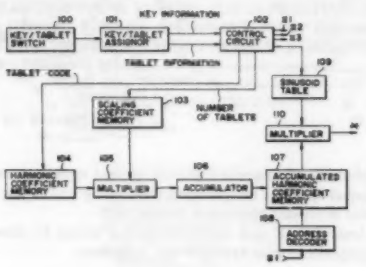
control data modifying means coupled to said switch circuit means and said second memory means for modifying the control data stored in said second memory by selectively operating said manual switches so that the respective generation mode constituting factors are additionally and selectively controlled by said manual switches.

4,466,325

TONE SYNTHESIZING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Kiyomi Takauji, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Apr. 26, 1982, Ser. No. 372,051
Claims priority, application Japan, Apr. 30, 1981, 56-65712
Int. Cl.³ G10H *1/08, 1/46*
U.S. Cl. 84—1.22 3 Claims



1. A tone synthesizing system for electronic musical instruments which computes, for obtaining a desired musical waveshape, amplitude value at sample points of the waveshape by a synthesizing system using a discrete Fourier transfer, comprising:

a plurality of tone tablet switch means for selecting a desired tone;

means for detecting the number of those of the tone tablet switch means which are selected simultaneously; and

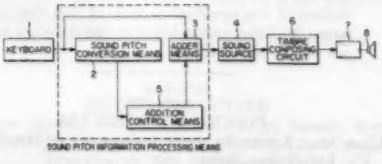
means for scaling one of harmonic coefficient values corresponding to the selected tone tablet switch means and sinusoid values for use in a discrete Fourier transfer at a ratio corresponding to the number of simultaneously selected tone tablet switches detected by the detecting means, thereby limiting a maximum level of an amplitude value of the desired synthesized waveshape to a value corresponding to the ratio.

4,466,326

ELECTRONIC MUSICAL INSTRUMENT

Takeshi Ogura; Kimimaro Tamura, and Yoshikazu Okuma, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 258,303, Apr. 28, 1981, abandoned.
This application Apr. 8, 1983, Ser. No. 483,202
Claims priority, application Japan, Apr. 30, 1980, 55-57352; Apr. 30, 1980, 55-57368; Apr. 30, 1980, 55-57377
Int. Cl.³ G10H *1/08, 1/36*
U.S. Cl. 84—1.22 9 Claims



1. An electronic musical instrument comprising:

(a) a keyboard device on which a player plays melodies or accompaniments;

(b) a sound pitch data processing means which delivers first sound pitch data specified by the actuation of each melody key of said keyboard device and simultaneously delivers second sound pitch data defining sound having a pitch

above the first sound pitch data specified by actuation of each said key, each sound defined by said second sound pitch data having a frequency exceeding that of the corresponding melody note by a predetermined number of semitones so as to produce colorful sound, said sound pitch data processing means being responsive to simultaneous actuation of a plurality of said keys to simultaneously deliver said second sound pitch data for all of said plurality of keys;

(c) a sound source which receives the sound pitch data from said sound pitch data processing means so as to produce the corresponding musical sound signals; and

(d) an electro-acoustic transducer means for converting the musical sound signals received from said sound source into acoustic signals.

4,466,327

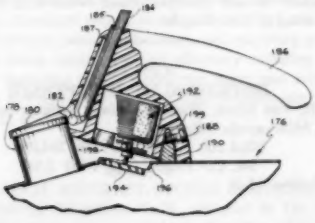
GAS DRIVEN MUSIC BOX

E. Louis Hinton, 851 Brighton, LaHabra, Calif. 90631

Filed Sep. 29, 1982, Ser. No. 428,484

Int. Cl.³ G10F *1/06*

U.S. Cl. 84—95 C **7 Claims**



1. A music box mechanism to be driven by a directed stream or pressurized fluid comprising:

an assembly base for mounting said music box mechanism,

a turbine wheel mounted on a turbine shaft rotatable mounted on said base,

a gas reservoir to contain said pressurized fluid,

passage means formed in said gas reservoir to direct said one or more streams of pressurized fluid to drivingly impinge said turbine wheel to cause said turbine wheel and said turbine shaft to rotate,

a speed reduction gear train in driven engagement with said turbine shaft and mounted on said base,

a musically programmed plectrum cylinder in driven engagement with said speed reduction gear train and rotatably mounted on said base, and

an array of tuned reeds mounted on said base in cooperative relationship to said plectrum cylinder.

4,466,328

MUSIC BOX FOR PLAYING MUSIC WITH DISK OR CARD AS MEDIUM

Yoshio Kitamura, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 17, 1982, Ser. No. 349,552

Claims priority, application Japan, Feb. 20, 1981, 56-22136[U]; Aug. 7, 1981, 56-116728[U]

Int. Cl.³ G10F *1/06*

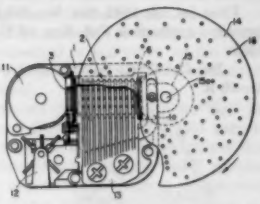
U.S. Cl. 84—98 **12 Claims**

1. A music box for playing music with a disk or card as a medium, comprising:

a vibrating reed assembly having a plurality of vibrating reeds therein;

a ratchet unit, said vibrating reed assembly and said ratchet unit being supported on a frame, said vibrating reed assembly being engaged with a plurality of ratchets in said ratchet unit, said plurality of ratchets being turned by said medium and each being annular and having teeth on an outer wall thereof;

said ratchet unit also having spacer means having a plurality of parallel grooves in an outer wall thereof, said ratchets fitting into said grooves with bottoms of said grooves



forming guide surfaces for inner walls of said ratchets, said spacer means being freely insertable into said ratchets; and

an elongated cylindrical member, said elongated cylindrical member being inserted between said spacer means inserted in said ratchets so as to position said ratchets in said grooves formed in said outer walls of said spacers.

4,466,329

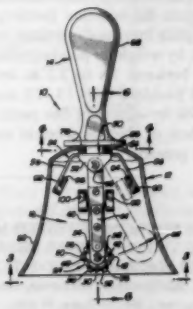
HANDBELL

Gamon B. Hayward, Escondido, Calif., assignor to Maas-Rowe Carillons, Inc., Escondido, Calif.

Filed Apr. 12, 1982, Ser. No. 367,377

Int. Cl.³ G10D *13/08*; G10K *1/00, 3/00*

U.S. Cl. 84—406 **11 Claims**



4. In a handbell:

(a) a bell;

(b) an operating handle attached to the head of the bell;

(c) a clapper assembly including a clapper and a clapper bar pivotally mounted adjacent the head of the bell for swinging movement in a plane;

(d) a first pair of permanent magnets carried by the clapper bar and movable towards and away from the waist portion of the bell at diametrically opposite sides of the bell;

(e) a cup of non-magnetic material for each of said magnets of said first pair, each cup having a threaded stem for adjustment of the lateral projection of the magnets;

(f) a second pair of permanent magnets; and

(g) bracket means mounting said magnets of said second pair in substantial alignment with the arcuate paths of movement of said magnets of said first pair respectively;

(h) said companion magnets imposing a yielding restraint upon movement of said clapper into contact with said bell and to cause retraction of said clapper from said bell after impact.

4,466,330

DISINTEGRATING, DENSELY FILLED POLYAMIDE MOLDING COMPOSITION

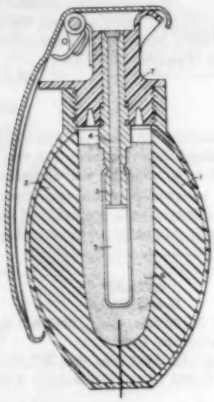
Heinz Juretzek, Münster; Wolfgang Kriesten, Marl, and Paul Sindermann, Nuremberg, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 399,123

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130569

Int. Cl.³ C06D *1/08;* **F42B** *3/00*

U.S. Cl. 86—20 R **12 Claims**



1. A polyamide molding composition densely filled with fine particulate metals for injection molding into molded articles which disintegrate into small particles, comprising:

(a) 5 to 20% by weight of polylauryllactam having a relative viscosity between 1.6 to 2.2 as determined by German Industrial Standard DIN 53 727; and

(b) 80 to 95% by weight of fine particulate metals.

7. The method of claim **6**, wherein said molded article is a practice hand grenade.

4,466,331

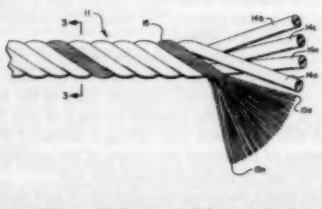
METHOD OF FORMING TWISTED MULTIPLE STRAND SYNTHETIC TWINE, TWINES PRODUCED THEREBY, AND FISHNETS FORMED THEREOF

Mackenzie W. Matheson, Vancouver, Canada, assignor to Redden Net Co., Inc., Bellingham, Wash.

Filed Jun. 6, 1983, Ser. No. 501,444

Int. Cl.³ A01K *73/00;* **D02G** *3/04, 3/44*

U.S. Cl. 87—12 **27 Claims**



10. A coreless multiple strand fishnet twine formed of filaments of synthetic materials comprising, in combination:

(a) a plurality of "A" strands each comprising a monofilament formed of synthetic material;

(b) at least one "B" strand comprising a plurality of twisted filaments formed of synthetic materials each substantially smaller in diameter than the diameter of said "A" strand monofilaments; and,

(c) said monofilament "A" strands and said multiple filament twisted "B" strand(s) being twisted together to form a multiple strand fishnet twine comprising a mixture of monofilament "A" strands and at least one multiple filament "B" strand wherein all "A" and "B" strands are exposed on the outer surface of said multiple strand fishnet twine over a substantial portion of their lengths.

19. A fish net formed from a plurality of twisted multiple strand fishnet twines knotted together to form an open mesh and wherein each of said twisted multiple strand fishnet twines comprises, in combination:

(a) a plurality of "A" strands each comprising a monofilament formed of synthetic material;

(b) at least one "B" strand comprising a plurality of twisted filaments formed of synthetic materials each substantially smaller in diameter than the diameter of said "A" strand monofilaments; and,

(c) said monofilament "A" strands and said multiple filament "B" strand(s) being twisted together to form a multiple strand twine comprising a mixture of monofilament "A" strands and at least one multiple filament "B" strand wherein all "A" and "B" strands are exposed on the outer surface of said multiple strand twine over a substantial portion of their lengths.

4,466,332

DISPERSING MINE DISPENSER

Peter H. Van Sloun, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Mich.

Filed Jul. 1, 1982, Ser. No. 394,086

Int. Cl.³ F42B *13/42;* **F41F** *5/02*

U.S. Cl. 89—1.5 R **4 Claims**

1. In combination:

launching means including a discharge tube having an open end and a closed end;

a stack of bodies in end-to-end relation in said tube;

a flexible tether extending in said tube from the outermost end of said stack past the innermost end thereof, said tether crossing said stack between each pair of said bodies and having a free outer end;

means at the closed end of said tube for propelling said stack of bodies out of said tube at said open end;

and means securing the inmost end of said tether to said launching means in such a manner that said tether does not become taut until said stack has passed out of said tube.

4,466,333

ARMORED VEHICLE

Gert Kausträter, Augsburg, Fed. Rep. of Germany, assignor to Kuka Wehrtechnik GmbH, Augsburg, Fed. Rep. of Germany

PCT No. PCT/EP81/00076, § 371 Date Feb. 8, 1982, § 102(e) Date Feb. 8, 1982

PCT Filed Jun. 15, 1981, Ser. No. 346,603

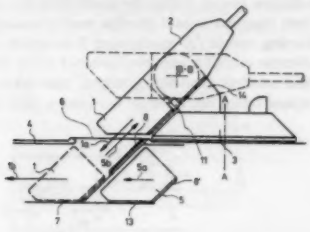
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022410

Int. Cl.³ F41H *7/06*

U.S. Cl. 89—36 H **2 Claims**

1. In an armored vehicle having an armored body, a turret mounted on or in said body for rotation thereon, a shield plate mounted on said turret, said shield plate including gun carrier bearing means, and a gun carrier mounted on said bearing means for rotation thereon for receiving a magzine container

releasably locked to said carrier at a container receiving position along said carrier, the improvement which comprises means defining an opening in said armored body, a horizontal slideway disposed within said armored body having a container reloading station at a position therealong, said turret and said gun carrier having rotational position relative to said armored body and said turret, respectively, in which said



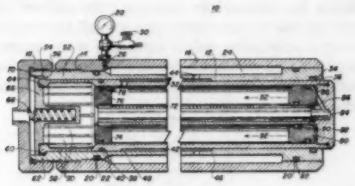
container receiving position on said gun carrier and said container reloading station on said slideway are aligned through said opening, conveyor means positionable through said opening for conveying a container between said receiving position and said reloading station, and said slideway including a first portion for removing empty containers from said reloading station and a second portion for delivering loaded containers to said reloading station.

4,466,334

HYDRAULIC AIRCRAFT/STORES CARTRIDGE

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1982, Ser. No. 356,552
Int. Cl.³ F15B *15/26*
U.S. Cl. 91—45 **2 Claims**



1. A hydraulic cartridge comprising:

a cylinder;

a cylinder cover attached to said cylinder for enclosing a fixed volume between said cylinder and said cylinder cover;

a cylinder cap attached to said cylinder for limiting access of a first fluid to said cylinder except through said cylinder cap;

a piston including a piston rod slideably mounted within said cylinder for extending from said cylinder upon occurrence of specific events;

a tube mounted within said piston, a passageway for passing fluid entering said cylinder cap the length of the piston rod before the first fluid can exit said passageway and enter said piston rod; an orifice in said piston rod;

an accumulator piston slideably mounted within said piston rod and around said tube for compressing a second fluid of preset pressure within said piston rod for forcing said second fluid out of said orifice when said first fluid enters said piston rod;

a means for triggering said piston rod to extend from said cylinder;

means for charging said second fluid in said piston rod to a preset pressure level; and

means for pressurizing said piston rod with said first fluid, where said pressurizing means comprises:

a valve with three positions connected to the cylinder cap for setting the first fluid's state in said cylinder and piston to either a "safe", an "arm", or a "fire" state;

a fill port connected to said valve via the "erm" position for filling said piston rod with the first fluid to a desired pressure level;

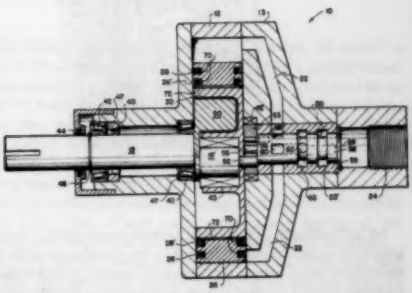
a sump connected to said valve via the "fire" position for providing a discharge path for said pressurized first fluid in said piston rod; and a restricted orifice passageway connected between the "safe" position of said valve and said sump for bleeding any pressure build-up from said piston rod when the piston rod is not to be triggered.

4,466,335

SEALING FOR VARIABLE VOLUME DEVICE

William W. Milburn, Jr., Boulder, Colo., assignor to Milburn Stirling Corporation, Boulder, Colo.

Filed Nov. 18, 1981, Ser. No. 322,502
Int. Cl.³ F01B *7/20*; F01L *33/02*
U.S. Cl. 91—173 **13 Claims**



1. In a variable volume device comprising an outer case defining a substantially closed six sided rectilinear chamber, an outer piston having an inner rectilinear opening disposed in the rectilinear chamber and mounted for reciprocal movement in a first direction to define two variable volumes, an inner piston disposed within the outer piston opening and mounted for reciprocal movement in a second direction transverse to the first direction to define two variable volumes, an eccentric member journaled relative to the case and mounted through the inner piston to produce a rotary motion of the inner piston and a relative reciprocal motion of the inner piston within the outer piston and the outer piston within the case, and valve means to selectively open and close fluid channels to the volumes defined between the outer piston and case, and inner piston and outer piston, the improvement comprising positioning rotatable mounted rollers between the outer case and the sides of the outer piston and between the inner piston and outer piston at the sides of each piston parallel to the direction of reciprocation of the piston, the rollers being journaled on axes parallel to the axis of rotation of the eccentric, the inner and outer pistons having grooves defined around the perimeter thereof adjacent to but spaced from each end of the piston forming a major side of the variable volume with sealing strips being carried in such grooves and in sealing relationships between the piston and the adjacent surface, and with the sealing strips each comprising two L-shaped segments of a thickness apporpriate to fit in the respective groove with said L-shaped segments, when fitted together, having a resulting

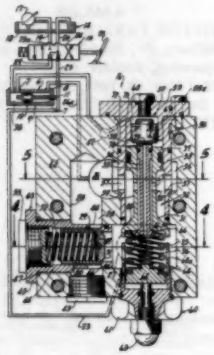
circumference slightly less than the corresponding dimension of the piston on the inner portion thereof and slightly more than such dimension of the piston on the outer portion of the segments, each of the segments having complimentary notches on opposed sides of the ends thereof, whereby two sealing strip segments may be fitted together to fit within the piston at the groove and extend beyond the piston to bear a sealing relationship with the adjacent wall, with the opposed notches fitting together to form a substantially gas tight interface.

4,466,336

CONTROL VALVE FOR HYDRAULIC MOTOR APPARATUS

J. Wesley Broome, Franksville, and Richard W. Witt, Hartford, both of Wis., assignors to Lakeland Hydraulics, Inc., New Berlin, Wis.

Filed Feb. 8, 1982, Ser. No. 346,651
Int. Cl.³ F15B *13/042*; F16K *15/18*
U.S. Cl. 91—420 **11 Claims**



10. A hydraulic driven load system comprising a reversable hydraulic motor means adapted to be overdriven with uncontrolled pumping action, a pressurized source of hydraulic fluid, first and second control valves connected to the opposite sides of said motor means, a directional valve means connecting said motor means to said control valves and including leakage means to by-pass said directional valve means, each of said control valves including parallel passageways between a first port and a second port a check valve means in a first of said parallel passageways and providing of flow in a first direction from the first port to the second port, a poppet valve means connected in the second passageway and operable to be selectively open to establish flow from said second port to said first port, a pilot operator coupled to selectively open said poppet valve means in response to the pressure level at said motor means, and said poppet valve means being constructed and arranged to open independently of said pilot operator in response to abnormal pressure level at said second port.

4,466,337

ELECTRO HYDRAULIC CONTROL WITH DEAD ZONE COMPENSATION

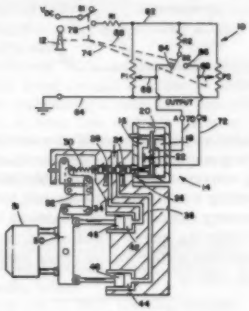
Alan H. Eller, Bloomington, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 25, 1982, Ser. No. 342,624
Int. Cl.³ F15B *13/044*
U.S. Cl. 91—506 **14 Claims**

4. An electro hydraulic control circuit for an electrically controlled hydraulic valve having a flow control element movable between a neutral position preventing flow through said valve and a flow position permitting flow through said valve wherein said flow control element moves an incremental amount before flow through said valve begins, said electro hydraulic control circuit includes;

electric motor means for moving said flow control element from said neutral position to said flow position when electric current is supplied to said electric motor means and wherein the amount of movement of said flow control element is proportional to said electric current to modulate flow through said valve,

an electric circuit means for controlling the amount of current supplied to said electric motor means, control positioning means for modulating the current output of said electric circuit means proportional to the displacement of said control positioning means, said control positioning means being displaceable between a zero output current



position and a full current output position, said electric circuit means providing no current output when said control positioning means is in said zero output current position and providing sufficient current output to said electric motor means to move said flow control element to said flow position when said control positioning means is in said full current output position,

the improvement comprising means in said electric circuit means for substantially increasing the current output of said electric circuit means upon a small movement of said control positioning means from said zero current output position, said substantial increase of current output being sufficient to move said valve element said incremental amount.

4,466,338

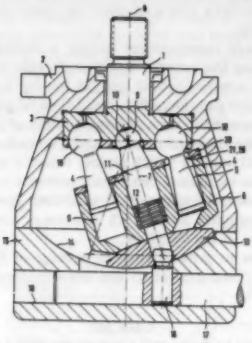
OBLIQUE-SHAFT AXIAL PISTON MACHINE HAVING A FOLLOWER PLATE FOR THE CYLINDER DRUM

Rainer Stoelzer, Elchingen, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,399
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125264
Int. Cl.³ F01B *13/04*
U.S. Cl. 91—506 **9 Claims**

1. An oblique-shaft axial piston machine having piston elements articulated in a drive disc fixedly connected to a drive shaft, in which the transmission of torque between said drive shaft and a rotatably mounted cylinder drum, supported on a rider and having axial cylinder bores in which piston elements travel to and fro, is effected exclusively by piston rod portions of said piston elements which, in at least one definite rotational position of the drive shaft and cylinder drum, meet the edges of slot-like openings in a follower plate connected to the cylinder drum, the width of said openings being less than the diameter of the cylinder bores, said machine being characterized in that

the follower plate is fixedly connectable to a locking part that completes each opening so as to form a hole enclosed all



around, whereby the follower plate together with the locking part constitutes a stable follower disc.

4,466,339

DIAPHRAGM ASSEMBLY

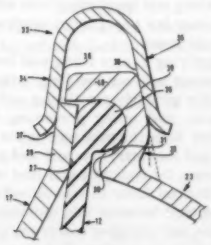
Francis G. Huddle, Eastleigh, England, assignor to William R. Selwood Limited, Eastleigh, England

Filed Jul. 21, 1982, Ser. No. 400,249

Claims priority, application United Kingdom, Jul. 23, 1981, 8122741

Int. Cl.³ F16J 3/02

U.S. Cl. 92—100 **5 Claims**



1. An assembly which defines an axis comprising:

a flexible diaphragm, two clamping members and a band,

wherein a peripheral portion of the diaphragm is clamped between respective clamping surfaces on the clamping members, peripheral portions of the clamping members are embraced by the band and the band is subjected to tension to establish and maintain pressure contact between the diaphragm and the clamping members, and

positioning means establishing a predetermined positional relation between the clamping members in the assembly,

said positioning means comprising an abutment on one of the clamping members for limiting mutual approach of the clamping surfaces when the band is tightened,

wherein the abutment has two opposed faces, both of which are engaged with the band.

4,466,340

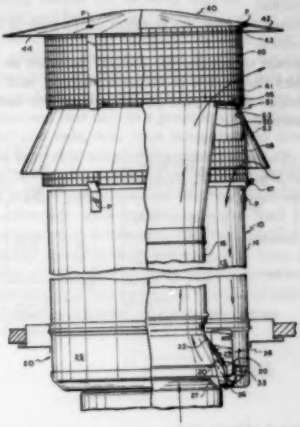
CHIMNEY ASSEMBLY

Clifton F. Briner, Fort Wayne, Ind., assignor to American Standard Inc., New York, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,548

Int. Cl.³ F23L 17/12

U.S. Cl. 98—60 **7 Claims**



1. An outside air-inducing assembly, one end of which is adapted to be coupled to the open lower end of a prefabricated chimney assembly and the other end of which is adapted to be coupled to a source of combustion gases, said chimney assembly including an inner flue and an outer conduit spaced therefrom to define therebetween an annular air passage to conduct only outside air downwardly therethrough, said outside air-inducing assembly comprising:

an annular collar adapted to be coupled at one end thereof to the lower end of said outer conduit and having at the other end thereof an annular baffle extending inwardly;

an air turning vane mounted in spaced relationship with said baffle and said other end of said collar to define a first air passage therebetween;

a convergent nozzle, the larger end of which is positioned within said air-turning vane and spaced therefrom to define a second air passage therebetween, the smaller end of said convergent nozzle being adapted to be coupled to said flue whereby a major portion of outside air flowing downwardly through said annular air passage flows around said air-turning vane through said air passage and a minor portion of said outside air flowing downwardly through said annular air passages through said second air passage between said larger end of said nozzle and said air-turning vane so that all of said outside air is induced into said flue through said convergent nozzle; and

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4,466,341

FUME HOOD ENERGY CONTROLLER

Dennis R. Grogan, P.O. Box 162, Andover, Mass. 01810

Filed Dec. 17, 1982, Ser. No. 450,754

Int. Cl.³ F23J 11/00

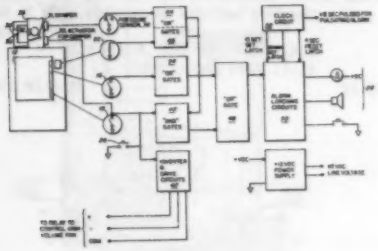
U.S. Cl. 98—115 LH **7 Claims**

1. In a system for controlling the operation of a fume hood wherein the fume hood includes a first high volume fan disposed in a first duct to draw air through the hood and a sash slideably mounted in the hood the improvement which comprises;

(a) a second duct to bypass the high volume fan;

(b) a second continuously operating low volume fan secured within the bypass duct;

(c) a damper disposed in the first duct upstream of the first fan;
(d) means to sense the pressure within the first duct and to provide an alarm output if the pressure violates a pre-established level which violation corresponds to an alarm condition;
(e) means to sense the position of the sash in a first closed position;
(f) means to sense the position of the sash in a second open position;
(g) means to actuate the damper between an open position when the sash is in its open position, and to actuate the damper to a closed position when the sash is its closed position;



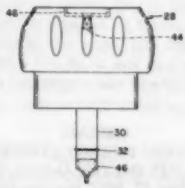
(h) status alarms; and
(i) means in communication with the first fan, the means to sense the pressure and the means to sense the position of the sash and the status alarms to
i. actuate the status alarms when a pressure alarm is sensed and the first fan is operating;
ii. to actuate the first fan to a non-operating mode when the position of the sash in the first position is sensed; and
iii. to actuate the first fan to an operating mode when the sash moves from its closed to its open position; and
iv. to actuate the status alarm when the position of the sash exceeds the second position.

4,466,342

CARBONATION CHAMBER WITH SPARGER FOR BEVERAGE CARBONATION

Peter A. Basile, Hudson, Ohio; Clara Ann Annese, Hamilton Square, and Dennis J. Colwell, East Windsor, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,235
Int. Cl.³ A23L *2/40*
U.S. Cl. 99—323.1 **10 Claims**



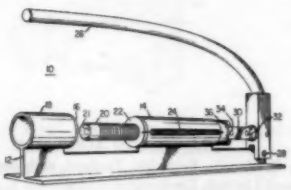
1. A pressurizable container for preparing therein a carbonated beverage from a water-based liquid and carbon dioxide-generating, chemical reactants designed to rapidly carbonate the liquid without agitation, comprising:
a. a container having an opening therein providing access to the contents thereof;
b. A carbonation chamber, insertable into said opening in the container for holding therein the chemical reactants and for substantially isolating the resultant chemical products of the chemical reaction to prevent their adversely affecting the palatability of the beverage, said chamber having
(1) an upper compartment for holding therein the chemical reactants and a quantity of water to promote the reaction,
(2) a lower compartment having a bottom sparger for releasing the generated carbon dioxide into a beverage in the container, said sparger having a porosity controlled to provide a first rapid flow of gas through the beverage in the form of large bubbles of CO_2 generated from the chemical reaction and a second moderate flow of small bubbles which rapidly dissolve in the beverage without increasing head space pressure to the point the reaction stops said second moderate flow sufficient to carbonate to a level of 3.5 volumes or more of CO_2 per volume of the beverage,
(3) means to provide for the passage of CO_2 from said upper compartment to said lower compartment.

4,466,343

AUTOMATIC ADJUSTING NUTCRACKER

Isaac J. Thompson, 2415 NW. Third Ave., Mineral Wells, Tex. 76067

Filed Oct. 26, 1982, Ser. No. 436,739
Int. Cl.³ A23N *5/00*
U.S. Cl. 99—572 **12 Claims**



1. An apparatus for cracking nuts, comprising:
a stationary jaw disposed along a longitudinal axis;
a post movable along said longitudinal axis;
a movable jaw fixedly mounted on one end of said post and movable along said longitudinal axis with said post toward said stationary jaw to act in conjunction therewith to hold a nut therebetween;
means for applying a force along said longitudinal axis;
a spring disposed between said longitudinal force means and said post for yieldably translating said longitudinal force to said post, said spring preventing translation of said longitudinal force to said post when a nut is disposed between said stationary jaw and said moveable jaw; and
engaging means for engaging said post to directly translate said longitudinal force to said movable jaw to crush an object disposed between said movable jaw and said stationary jaw, said engaging means engaging said post when the nut restricts movement of said moveable jaw such that a cracking force can be delivered to said moveable jaw.

4,466,344

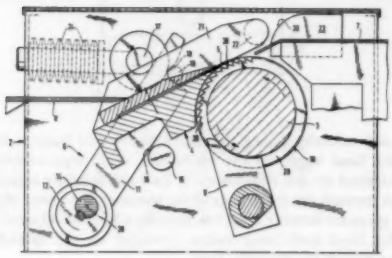
MACHINE FOR SKINNING BACON OR THE LIKE

Hermann Schill, Kehl, Fed. Rep. of Germany, assignor to Maja-Maschinenfabrik Hermann Schill GmbH, Kehl-Goldscheuer, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,579
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216150
Int. Cl.³ A22C *17/12*
U.S. Cl. 99—589 **25 Claims**

1. A machine for skinning bacon or analogous products, comprising a frame; a support mounted in said frame and including a knife holder and at least one arm supporting said holder; a traction device movably mounted in said frame and

arranged to advance products into the range of the knife which is carried by said holder; means for adjusting the position of said support with reference to said traction device including first and second abutment means provided in said frame and displacing means actuatable to move said support with reference to said frame between at least one first position in which said support engages or is close to said first abutment means and at least one second position in which said support engages said second abutment means, said displacing means including at least one eccentric which is rotatable relative to said frame to thereby move said holder to said first and second positions,



said first abutment means comprising a pivot member for said arm and said arm being pivotable with reference to said pivot member in the first position of said support and said holder being accessible for detachment from said arm in such first position of said support, said second abutment means comprising at least one cam and said support further including follower means arranged to track said cam in the second position of said support to thereby maintain the knife which is carried by said holder at any one of a plurality of different distances from said traction device; and means for yieldably biasing the knife in said holder toward said traction device through the medium of said support.

4,466,345

APPARATUS FOR PRESSING AND BINDING BALES OF REFUSES

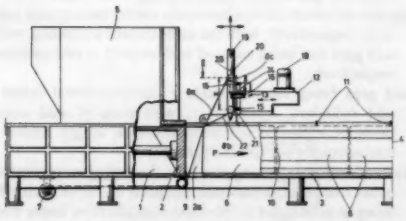
Erwin Kaldenbach, Ratingen, Fed. Rep. of Germany, assignor to Lindeman Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 30, 1984, Ser. No. 454,643

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202233

Int. Cl.³ B65B *13/02*

U.S. Cl. 100—19 R **10 Claims**



1. In a machine for pressing bales of refuse and binding said bales with wire, said machine comprising a pressing box, plunger means in said box, means for feeding refuse to said box, means for moving said plunger means in said box to press refuse in said box to form a bale and push said bale from an outlet from said box, the bale has a front face and a rear face with the front face leading when the bale is pushed out of said box and the rear face being pushed by said plunger means and a first surface and an oppositely facing second surface with the first and second surfaces extending in the pressing direction of said plunger means, and a bale binding mechanism, said mechanism including wire supply means for supplying bale binding wire from a rearward position relative to the outlet from said box forwardly in a direction in which said bale is pushed from said box, twisting means for twisting together ends of wire extending around said bale, cutting means for cutting said wire, a binding needle arranged to be reciprocated in a path transverse to said pressing direction, said binding needle being reciprocably movable across the rear face of said bale after said bale has been pushed from said box to form a loop of wire extending across said rear face to a position spaced beyond the first surface of said bale, said loop being formed from wire which extends from said wire supply means along the second surface of said bale and across the front face of said bale, and for conveying wire beyond from said first face opposite to the said pressing direction to a position adjacent said twisting means, the improvement comprising that said binding needle being reciprocally movable together with said loop along a path which is parallel to said pressing direction and is spaced outwardly from said first face to move a portion of said wire in said loop to a position adjacent said twisting means.

4,466,346

GARLIC SQUEEZER, PROVIDED WITH MEANS FOR REMOVING THE SQUEEZED CLOVES

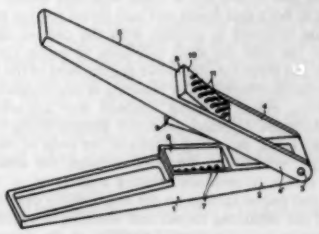
Carlo Gemelli, Via P/ta Villa Ada, 16, 28026 - Omegna (Novara), Italy

Filed Dec. 11, 1981, Ser. No. 329,662

Claims priority, application Italy, Feb. 27, 1981, 20932/81[U]

Int. Cl.³ B30B *9/00*

U.S. Cl. 100—112 **5 Claims**



1. A squeezer for garlic cloves which comprises a first rectilinear arm (1) and a second rectilinear arm (5), said first rectilinear and second rectilinear arm being pivoted at one end around a pivot pin (3), said first rectilinear arm having a seat, provided with perforations (7) in the bottom thereof, said second rectilinear arm having at a position corresponding to said seat, a block (8,9) which has two portions, one projecting above and one projecting under said second arm, one projecting portion being insertable into said seat when the garlic cloves are squeezed, the other projecting portion being provided with tooth members, said two projecting portions being confined by surfaces which converge towards the pivot pin, said projecting portion, which has teeth, being insertable into said perforations when the cloves are removed after squeezing upon a complete rotation of the first and second arms about said pivot pin.

4,466,347

DEVICE FOR CONVEYING INK OR A DAMPING AGENT

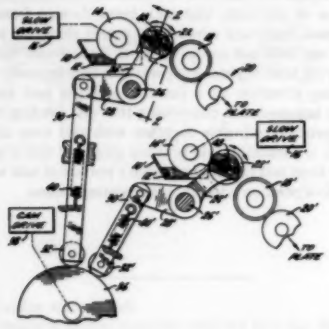
Kurt Difflipp, Dietzenbach; Helmut Emrich, Offenbach am Main; Horst Erbach, Hofheim; Klaus Neberle, Heusenstamm; Heinrich Ochs, Oberzell, and Günter Schwebe, Hainburg, all of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 13, 1982, Ser. No. 397,829

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 3127647

Int. Cl.³ B01F *15/06*

U.S. Cl. 101—148 4 Claims



1. In a fluid supply system for a printing press, the combination comprising a frame, a fountain including a fountain roller journalled in the frame and driven at slow speed so that a film of fluid is formed on its surface, a distributor roller journalled in said frame parallel to the fountain roller and spaced therefrom to form a gap, a ductor roller movable broadwise through a short distance in the gap, a pair of arms for supporting the ends of the ductor roller, a shaft journalled in the frame for rigidly supporting the arms, a driving arm rigidly secured to the shaft, a thrust rod having one end pivotally connected to the driving arm and the other end carrying a cam follower, a rotary cam and means for driving said cam means directly connected to both said frame and said thrust rod for maintaining the cam follower in contact with the cam so that upon rotation of the cam the shaft oscillates to swing the ductor roller back and forth for successive engagement of the fountain roller and the distributor roller resulting in conveyance of fluid therebetween, means defining opposed way surfaces at the ends of the arms oriented generally perpendicularly to the plane of the arms, mounting blocks at the ends of the ductor roller snugly slidable on the way surfaces, the cam having sufficient throw to produce relative overtravel of the cam follower, and paired springs on the respectively opposite sides of each of the mounting blocks and working in opposition to one another to define a normal position of the ductor roller with respect to the arms on which it is mounted and so that upon engagement of the rollers the relative overtravel is yieldingly accommodated by the deformation of the springs.

4,466,348

OFFSET INTAGLIO PRINTER HAVING A SPREADER WITH A LATERALLY EXTENDING SLOT

Rudolf Buhrer, Opfertshofen, Switzerland, assignor to Teca-Print AG., Thayngen, Switzerland

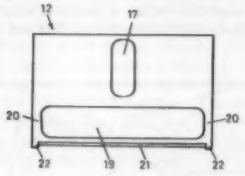
Filed Feb. 3, 1983, Ser. No. 463,655

Claims priority, application Switzerland, Feb. 12, 1982, 908/82

Int. Cl.³ B41F *17/00, 31/00*

U.S. Cl. 101—163 6 Claims

1. Swab printing machine having an inking device, an ink container and a carriage, the carriage including on its frontal side a spreader support, which spreader support is tippable and can reciprocate over a printing plate, a spreader having lower and upper parts wherein the spreader is upwardly and rearwardly inclined from said lower part to said upper part, and a spreader head including a doctor blade, the spreader being loosely guided in the spreader head and drawn downward by its own weight thereby taking ink from the ink container during its forward motion and distributing it over the printing



plate, and whereby during the return, the doctor blade in the spreader head wipes off the excess ink, with improvements characterized by and comprising: at least one laterally extending slot through the lower part of the spreader, the lower edge of the spreader forming a narrow dipping edge, and adjustable spreader head positioning means provided on the spreader support and on the spreader head.

4,466,349

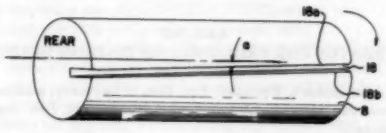
CYLINDER CONSTRUCTION FOR A PRINTING PRESS

Norman C. Bartlett, 202-64 Soundview Ave., Stamford, Conn. 06902

Filed Dec. 21, 1981, Ser. No. 332,465

Int. Cl.³ B41F *5/04*

U.S. Cl. 101—220 11 Claims



1. In a printing press having a pair of counterrotating blanket or impression cylinders forming a nip for printing on a traveling web of paper the improvement comprising:

each of said cylinders having an outwardly open blanket receiving gap therein extending the axial length thereof;

blanket members circumferentially encompassing said cylinders, respectively, with the ends thereof extending within said gaps and being secured with respect to said cylinders, respectively;

said gaps being located within a circumferential extent of said cylinders, respectively, with each of said extents being of a preselected circumferential length limited to commercially acceptable practice;

each of said gaps having the ends thereof circumferentially offset from each other with the linear extent of such offset being at least equal to the maximum effective linear width of said gap, said gaps extending in opposite manner in said cylinders, respectively, to pass in criss-crossing relationship when moving through such a nip;

and said gaps extending at angles with respect to an axial extent of the outer surfaces of said cylinders, respectively, to continuously maintain at least the end portions of said cylinders in overlying relationship as said cylinders pass through such a nip and with at least the ends of said gaps passing in non-overlying relationship.

4,466,350
SHEET TRANSFER CYLINDER ASSEMBLY OF A SHEET-FED ROTARY PRINTING MACHINE HAVING A DEVICE FOR CORRECTING REGISTER OF OVERPRINTS

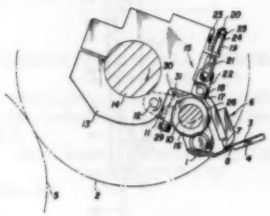
Paul Schilling, deceased, late of Neckargemünd, Fed. Rep. of Germany, and by Erika Schilling, heir, Heidelberger Str. 2, 6903 Neckargemünd, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,849

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3112964

Int. Cl.³ B41F *21/05*

U.S. Cl. 101—410 **9 Claims**



1. Sheet transfer cylinder assembly of a sheet fed rotary printing machine including a sheet transfer cylinder rotatable in a given rotational direction and a device for correcting register of overprints on a sheet by deforming the leading edge of the sheet, comprising a gripper fly supported on a shaft, said shaft being mounted on the sheet transfer cylinder so as to be swingable relative to the rotary motion of its sheet transfer cylinder, a bending device carried by the sheet transfer cylinder in a middle region thereof, and means for actuating said bending device in accordance with the swinging movement of said gripper fly for flexing said shaft of said gripper fly and deforming the leading edge of the sheet in a direction tangential to the circumference of the cylinder, said shaft of said gripper fly being supported by a bearing substantially at the middle thereof, and including means for pivoting said bearing in the direction of rotation of the cylinder and opposite the direction of rotation of the cylinder.

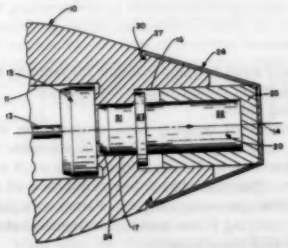
4,466,351
IMPACT PROBE MECHANISM FOR AMMUNITION FUZING

Victor H. Strobush, Hennepin County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 24, 1982, Ser. No. 391,667

Int. Cl.³ F42C *1/02*

U.S. Cl. 102—275 **2 Claims**



1. In a fuse for firing the explosive charge of a projectile, in combination:

a firing mechanism mounted in said projectile for rearward axial contact to fire said charge;

a plastic probe extending between a forward end and a rearward end;

and means mounting said probe axially in said projectile with said rearward end slightly spaced forward of said mechanism and with said forward end positioned to receive impacts transmitted from media traversed by said projectile, so that a momentary impact produces a shock wave in said probe to cause engagement of said rearward end with said firing mechanism to fire said charge,

the spacing between said rearward end and said mechanism determining the magnitude of an impact which is sufficient to cause said firing of said charge.

4,466,352
DUAL-MODE PROPELLANT CHARGE WITH A TRUMPET-SHAPED CHANNEL POSSESSING A STAR-SHAPED CROSS-SECTION

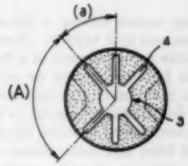
Francis Dalet, Tresses, and Bernard Ducourneau, La Teste, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Feb. 4, 1982, Ser. No. 345,778

Claims priority, application France, Feb. 17, 1981, 81 03048

Int. Cl.³ C06B *45/12*

U.S. Cl. 102—288 **11 Claims**



1. Propellant charge which has at least two thrust modes, of the "trumpet block" type with radial combustion from a central channel with one thrust mode contained in a portion which has a star-shaped cross-section over a length equal to at least one third of the total length of the charge, wherein the part of the channel which is of star-shaped cross-section possesses a zone in which the star of the channel has at least six arms, which determine at least six tooth-like sectors of propellant, said part of the channel which is of star-shaped cross-section consists only of said tooth-like sectors, at least two tooth-like sectors with the same large sector angle (A) and at least two tooth-like sectors of propellant with the same small sector angle (a), distributed symmetrically relative to the axis of the charge, wherein the large sector angle (A) is defined, in terms of the small sector angle (a), by the following relationship:

$$(2a-10°)<A<(2a+25°)$$

and wherein the small sector angle (a) is between 25° and 60°.

4,466,353
HIGH VELOCITY JET SHAPED CHARGE

Fred I. Grace, York, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 24, 1983, Ser. No. 478,401

Int. Cl.³ F42B *1/02*

U.S. Cl. 102—307 **3 Claims**

1. A shaped charge device which comprises:

a hollow cylindrical shaped housing having a longitudinal axis;

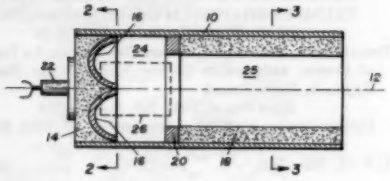
first explosive means, including an explosive charge having substantially cylindrical shape operatively disposed in one end of said housing, for generating a first detonation wave;

detonator means comprising means for producing a single point or annular detonation wave in said first explosive

means operatively positioned on the outer side of said first explosive means for selectively initiating explosion in said first explosive means;

shaped charge liner means in abutment with and at the inner side of said first explosive means, said inner means forming a convex hollow toroid surface, convex in the direction of the said first explosive means, which deforms upon explosion into an approximate hollow open ended tube-shaped first slug expelled at a first velocity, preceded by a narrow first jet of high velocity gases of the explosion, said liner being metal which density is varied for use in defeating various targets,

delay means comprising an annular shaped delay member placed to the rear of said liner means;



said explosive means having a detonation velocity rate-greater than said first velocity of said first slug, said second explosive means shaped as a hollow cylinder fitting within said housing, having an inside diameter slightly larger than the outside diameter, and length greater than length of, said first slug, placed to the rear of said delay means and initiated by a second detonation initiation wave transmitted from said delay means, said delay means delaying transmission of said second detonation initiation wave until said first slug is completely contained within the length of said second explosive means,

whereby when said second explosive means is detonated, the said first slug is deformed into a second slug which is relatively rod-shaped, expelled at a second velocity, preceeded by a second jet of relatively high velocity gases of the second explosion,

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4,466,354

APPARATUS FOR CHARGING RISING DRILLHOLES

Leif Jelberyd, Handen, and Gunnar Egerström, Danderyd, both of Sweden, assignors to Nitro Nobel AB, Gyttorp, Sweden

Filed Mar. 30, 1982, Ser. No. 363,495

Claims priority, application Sweden, Apr. 3, 1981, 8102164

Int. Cl.³ F42B *3/00*

U.S. Cl. 102—313 **4 Claims**

1. Apparatus for charging rising drillholes having large bores with heavy pipecharges comprising:

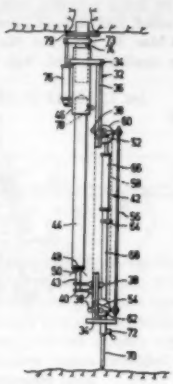
(a) a stand having an upper end portion and a lower end portion, said lower end portion pivotal on a fixed surface and said upper end portion capable of alignment with the mouth of a rising drillhole,

(b) a guide unit including a first guide member having an upper end and a lower end, said first guide member being rigidly attached to said upper end portion of said stand, and a second guide member having a bore of a size sufficient for receiving a pipecharge, said second guide member having a lower end portion telescopically receivable within said upper end or said first guide member and an upper end portion extendable beyond said upper end of said first guide member and receivable within said mouth of said drillhole,

(c) anchoring means attached to said upper end portion of said second guide member,

(d) drive means interconnecting said first and said second guide members for moving said second guide member relative to said first guide member, thus securing said anchoring means in abutting relationship against the area of the formation adjacent to said mouth of said drillhole thereby wedging said charging apparatus between said fixed surface and said formation, and

(e) lifting means associated with said stand including a rest platform for carrying a pipecharge, said platform capable



of traveling toward and away from said lower end of said first guide member whereby said pipecharge, when supported on said rest platform, will be guided into said drillhole by said guide unit when said platform is moved toward said lower end of said first guide member.

4,466,355

RAILWAY TRACK TAMPING MACHINE

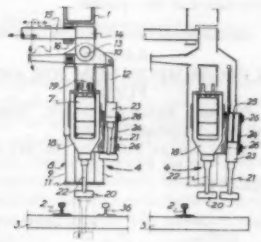
Sandro Pasquini, La Tour de Peilz, Switzerland, assignor to Sig Societe Industrielle Suisse, Neuhausen, Switzerland

Filed Feb. 12, 1982, Ser. No. 348,971

Claims priority, application Switzerland, Feb. 24, 1981, 1198/81

Int. Cl.³ E01B *27/16*

U.S. Cl. 104—12 **2 Claims**



1. A railway track tamping machine for tamping switches as well as open track, comprising in combination:

(a) a rolling chassis;

(b) a plurality of tamping units mounted on said rolling chassis, said tamping units being displaceable in a direction transverse to the elongation of the track to tamp the track on either side of each line of rails as well as to avoid lateral obstacles upon tamping of track switches;

(c) a tool carrying frame mounted for vertical movement in each of said tamping units;

(d) two levers mounted in opposition on said tool carrying frame, said levers being articulated on the tool carrying frame for oscillating and pivotal movement in a plane parallel to the direction of elongation of the track;

(e) first and second tamping picks mounted on each of said

two levers, said first and second tamping picks forming with their respective lever one tamping tool located on one side of a line of rails;

(f) means for fixedly fastening each of said first tamping picks on the levers in a downward work condition;

(g) means for moving each of said second tamping picks on the levers between a first lowered position in which said second tamping pick is in a downward work condition adjacent to said first tamping pick with respect to the direction transverse to the elongation of the track and a second raised position in which said second tamping pick is not in a work condition; and

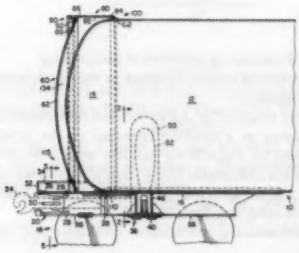
(h) means for immobilizing said second tamping picks in each of said first and second positions.

4,466,356

FULL DIAMETER HEAD SHIELD CONSTRUCTION FOR RAILWAY TANK CAR

Robert C. Messersmith, and Richard B. Polley, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 22, 1981, Ser. No. 227,122
Int. Cl.³ B61D *5/00*
U.S. Cl. 105—358 **21 Claims**



1. A head shield assembly for railway tank cars having a bolster assembly comprising: a head shield located outboard of a tank located on a railway tank car; said head shield extending from a level adjacent a rail car center sill upwardly to a level adjacent the top of said tank; said shield further being acruate and extending at least partially around the end portion of said tank; an anchor member extending longitudinally inboard of said shield to a position above but adjacent to the top of said tank and not substantially further inwardly than said bolster assembly; said anchor further extending downwardly along each side of said tank to a position adjacent said sill and outboard of said bolster assembly; first connecting means integrally joining an outer portion of said shield to said anchor at least at positions located on the top portion of said shield and said anchor and at positions located on either side of said tank; second connecting means integrally joining the inboard portion of said anchor to said tank at positions located at the top of said tank and at positions located on either side of said tank at a location outboard of said bolster assembly; and third connecting means integrally joining the lower portion of said shield to said sill.

4,466,357

AFTER HOUR DEPOSITORY

Hiroshi Masachika, Hiroshima, Japan, assignor to Kumahira Safe Co. Inc., Hiroshima, Japan

Filed Mar. 29, 1982, Ser. No. 363,388
Claims priority, application Japan, Feb. 3, 1982, 57-14832
Int. Cl.³ E05G *1/26*
U.S. Cl. 109—66 **11 Claims**

1. An apparatus for depositing money into a receiving safe in a bank comprising:

a framework adapted to be fitted into a rectangular opening on a bank wall;

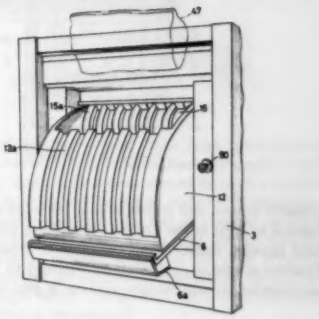
a door having a front surface closing said opening, a handle at the upper end thereof, side walls and a rear partition defining a concave rear wall;

a first horizontally extending shaft in said framework mounting said door for rotation thereabout;

a movable wall;

a second shaft extending between said side walls for rotation with said door and mounting said movable wall for rotation so that rotation of said door from a closed to an open position causes said movable wall to rotate in a first direction, scraping said concave rear wall, to a position defining a pocket for receiving a package for deposit and rotation of said door from said open to said closed position rotates said movable wall in a second direction opposite to said first direction to release a package in said pocket;

a first rotary lever engaging said movable wall for rotating



said wall, said first lever releasing said movable wall so that said movable wall rotates by gravity while scraping said rear wall;

a rachet mechanism including a pawl, a shaft third extending between said side walls mounting said pawl for rotation with said door and a rachet plate fixedly-secured to a side wall of the framework, the rachet plate including a plurality of grooves, said rachet pawl being pivotally disposed by said third shaft, the rachet pawl being adapted to engage a said groove in said rachet plate, and;

a second rotary lever having first and second ends engaging said pawl at the first end and pivotally attached to said first rotary lever at the second end during rotation thereof and releasing said pawl from said groove when said door is in said open position so that, upon rotation of said door thereafter toward said closed position at a position wherein said pocket is inaccessible, causes said pawl to engage said groove and prevent rotation of said door in said first direction until said door is in said closed position.

4,466,358

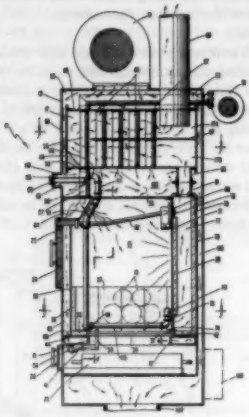
SOLID FUEL WARM AIR FURNACE

J. Vernon Christian, 2160 Longreen Rd., Kingsport, Tenn. 37660

Division of Ser. No. 270,550, Jun. 4, 1981, Pat. No. 4,409,955.
This application Feb. 14, 1983, Ser. No. 466,319
Int. Cl.³ F23B *5/00*; F23H *1/02*
U.S. Cl. 110—211 **6 Claims**

1. A furnace comprising a housing, a firebox disposed internally of and spaced from the walls of said housing, an open grate disposed at the bottom of said firebox, a door in the front of said housing for inserting solid fuel into said firebox, means for delivering combustion air to an area beneath said grate for preheating and causing said air to pass upwardly through said solid fuel and to mix with gases released from said fuel during combustion, a burn-out chamber between said firebox and the rear of said housing and insulated from said firebox, said burn-

out chamber having an inlet communicated with said firebox and an outlet communicated with a heat exchanger chamber, exhaust means connected to said heat exchanger chamber for drawing said air/gas mixture from said firebox through said burn-out chamber to said heat exchanger chamber and out said



exhaust means, and means at said burn-out chamber inlet and heated by heat in the firebox for igniting said air/gas mixture, said igniting means being operable to retain the flame from ignition of said air/gas mixture, whereby to promote complete combustion of said air/gas mixture in said burn-out chamber.

4,466,359

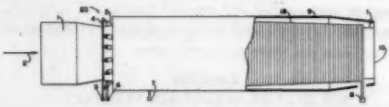
DISC STABILIZED FLAME AFTERBURNER

Roy Weber, P.O. Box 336, and Bruce C. Huddleston, 865 N. Kalaheo Ave., both of Kailua, Oahu, Hi. 96734

Continuation-in-part of Ser. No. 65,800, Aug. 13, 1979, Pat. No. 4,345,529, which is a division of Ser. No. 906,814, May 17, 1978, Pat. No. 4,181,081, which is a continuation of Ser. No. 726,529, Sep. 27, 1976, abandoned. This application Mar. 13, 1981, Ser. No. 243,400

Int. Cl.³ F23B *5/00*

U.S. Cl. 110—213 **4 Claims**



1. Pollution control apparatus comprising

a conduit having an inlet for receiving pollutants and an outlet for expelling relatively pollution free exhaust,

flow diverting means positioned in the conduit in the vicinity of the inlet for condensing the flow of pollutants in the conduit,

combustion means connected to the conduit for burning pollutants immediately downstream of the flow diverting means, and

temperature control means connected to the flow diverting means for controlling the temperature of the flow diverting means.

4,466,360

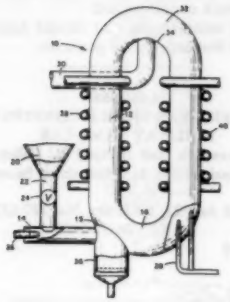
LOOP-BED COMBUSTION APPARATUS

Jer-Yu Shang, Fairfax, Va.; Joseph S. Mei, Morgantown, W. Va.; Frank D. Slagle, Kingwood, W. Va., and John E. Notestein, Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 14, 1982, Ser. No. 449,793

Int. Cl.³ F23D *1/02*

U.S. Cl. 110—264 **8 Claims**



1. A loop-bed reactor or combustor comprising:

a vertically oriented tubular housing in the configuration of an oblong annulus;

conduit means coupled to the outermost peripheral surface of the housing at a location adjacent to the lowermost bight defined by the oblong annulus with a longitudinal axis of said conduit means being tangentially oriented with respect to the longitudinal axis of the tubular housing at the point of coupling therewith;

means for introducing particulate fuel into said conduit means;

pneumatic means in registry with said conduit means for unidirectionally propelling the particulate fuel into the housing;

further pneumatic means in registry with the housing downstream of the coupling between the conduit means and the housing for further propelling the particulate material through the length of the annulus; and

discharge port means disposed through the innermost peripheral surface of the housing at a location in or slightly downstream from the uppermost bight defined by the oblong annulus with said discharge port means adapted to receive gaseous combustion products and particulate material of a size less than that maintainable in close proximity to the radially outermost portion of the uppermost bight by the centrifugal force imposed upon the particulate material by the pneumatic means when propelled through the housing.

4,466,361

METHOD AND APPARATUS FOR WASTE INCINERATION

Maurice D. Henery, Evanston; John M. Kerwin, Flossmoor, and Walter W. Walker, Matteson, all of Ill., assignors to Marblehead Lime Company, Chicago, Ill.

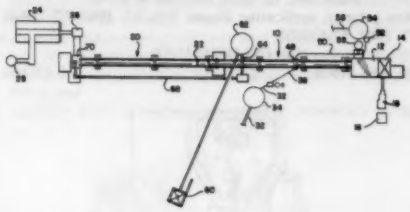
Filed May 26, 1983, Ser. No. 498,598

Int. Cl.³ F23G *5/06*

U.S. Cl. 110—346 **11 Claims**

1. A method for incinerating toxic and non-toxic waste materials comprising the steps of providing a pretreatment agent capable of insuring flowability in the material to be incinerated, mixing said agent with said material, providing a rotary kiln, firing said kiln, providing a rotary scoop feeder for said kiln, mixing of said agent with said material being accom-

plished by introducing said agent to said rotary scoop feeder whereby the agent is mixed with said waste material in said feeder, introducing the mixture of waste material and agent into a hot zone of said kiln by means of said feeder whereby the



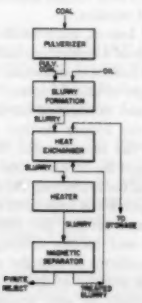
mixture is delivered directly into a zone of sufficient temperture to achieve initial incineration and whereby the incineration is completed as the mixture progresses to a discharge end of the kiln where an incinerated mixture is achieved, and removing the incinerated mixture from the kiln.

4,466,362

METHOD OF REMOVING SULFUR AND OTHER CONTAMINANTS FROM THE COAL IN COAL-OIL SLURRIES

Emanuel Maxwell, Cambridge, and David R. Kelland, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 3, 1982, Ser. No. 354,459
Int. Cl.³ F23K *5/00*; C10L *1/32*
U.S. Cl. 110—347 **1 Claim**



1. A process for the removal of sulfur and other contaminants from the coal in a coal-oil slurry prior to combustion of the slurry comprising:

grinding the coal to a size appropriate for the liberation of pyrite and suspension in an oil slurry;

slurrying the coal with oil;

heating the slurry to a temperature between the range of 210°–230° C. to enhance the magnetic properties of pyrrhotite and pyrite bound thereto;

separating the pyrite magnetically from the heated slurry;

thereafter passing the heated slurry through a heat exchanger in which unheated slurry is passed to recover and transfer heat from the heated slurry to the unheated slurry; and

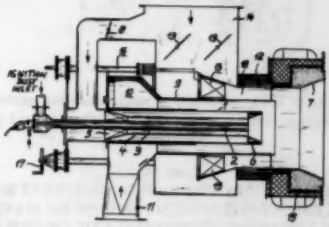
burning the heated slurry in a boiler.

4,466,363

METHOD OF IGNITING A PULVERIZED COAL ANNULAR BURNER FLAME

Klaus Leikert, and Sigfrid Michelfelder, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 176,186, Aug. 7, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 358,860
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933040
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **7 Claims**



1. A method of igniting a coal dust fired main burner wherein the main burner has an internal back flow region and is ignited by a dust-ignition flame introduced through a central core passage, the main burner having air introduced through a main air passage and pulverized solid fuel introduced through a dust conduit wherein the main air passage has an annular section surrounding an annular section of the dust conduit, which annular section of the dust conduit surrounds the central core passage through which the ignition flame is introduced, the method comprising the steps of:

introducing the dust ignition flame centrally into the internal back flow region by injecting it centrally through the central core passage;

utilizing coal dust entrained in air as an ignition fuel with the ratio of dust-laden air to dust for the ignition flame being in the range of 0.2 to 1.0 while the ratio for the burner flame is in the range of 1.5 to 2.0;

burning the ignition flame at a smaller air number than the main burner flame with the air number for the ignition flame being in the range of 0.8 to 1.1 while that of the main flame being in the range of 1.1 to 1.3;

supplying combustion air to the ignition flame by connecting the central core passage to the main air passage, and

providing a greater tangential combustion-air velocity component for said dust-ignition flame than for the main burner flame.

4,466,364

PLANTER ATTACHMENT

Dave Hassenfritz, R.R. #4, Mt. Pleasant, Iowa 52641

Filed May 14, 1982, Ser. No. 378,448
Int. Cl.³ A01C *5/08*; A01B *25/00*
U.S. Cl. 111—1 **1 Claim**

1. An attachment, for adapting a planter to minimum tillage and no-till situations, comprising:

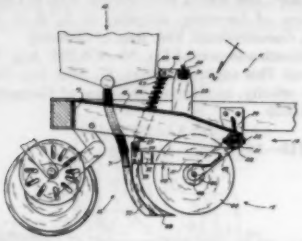
frame means joined to the planter;

means for cutting trash and incorporating fertilizer mounted at the forward end of the planter by said frame means and including a disc, a knife disposed directly behind said disc, and a spring control means connected to said disc and knife; and

strap means extends from said frame means, includes a strap pair, said disc being mounted in said strap pair, and further includes a third strap, said knife being mounted to, and said spring control means being received by, said third strap, and

said third strap is joined to said strap pair, has a curved

portion, a mounting portion joined to said curved portion, and an extended plate joined to said mounting portion,



said knife being attached to said mounting portion, and said spring control means being attached to said plate.

4,466,365

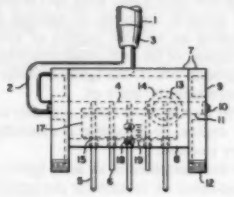
MANUALLY MANIPULATED AGRICULTURAL IMPLEMENT WITH SEED ENCLOSURE HAVING TOOTH MEMBERS EXTENDING OUT OF HOLES IN THE ENCLOSURE

William C. Conkling, 50 Wootton Rd., Essex Fells, N.J. 07021

Filed May 20, 1982, Ser. No. 380,477

Int. Cl.³ A01C 7/02

U.S. Cl. 111—72 **8 Claims**



1. An agricultural implement, comprising:

enclosure means including a seed filling opening and a plurality of holes for the outward passage of the seed;

tooth member means including a corresponding plurality of tooth members substantially smaller in diameter than the diameter of the holes, said tooth members oriented so that ones of their ends extend inside the enclosure means and the others of their ends project external to the enclosure means through corresponding holes;

mechanism means intermediate the enclosure means and the tooth member means, said mechanism means coupled to the tooth members near the ones of the ends and coupled to the enclosure means, and arranged to restrain axial displacement and to enable lateral displacement of the tooth members relative to the holes in response to differential forces externally applied to the enclosure means and the tooth member means;

an enlongated handle rigidly coupled at one end to one of the enclosure means, the mechanism means and the tooth member means for manual manipulation of the implement;

each of the plurality of holes of the enclosure means being oblong with major and minor axes, the minor axes being normal to an imaginary vertical plane containing the handle and being longer than the corresponding dimension of the tooth members, the major axes being parallel to said imaginary plane and being longer than the corresponding dimension of the tooth members; and

a movable plate secured to the enclosure and overlapping the plurality of holes of the enclosure means, whereby the lengths of the major axes are adjustable.

4,466,366

METHOD OF TUFTING CUT PILE AND LOOP PILE IN THE SAME ROW OF STITCHING

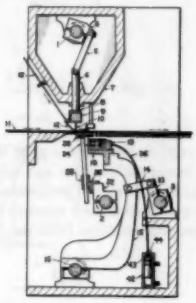
Toshiaki Hirotsu, Osaka, Japan, assignor to Hanlisuchiiru Co., Ltd., Japan

Filed Feb. 11, 1983, Ser. No. 465,795

Claims priority, application Japan, Feb. 12, 1982, 57-21901; Jul. 27, 1982, 57-131053

Int. Cl.³ D05C 15/00

U.S. Cl. 112—79 R **5 Claims**



1. A tufting machine comprising:

a plurality of needles each feeding a respective yarn, means for driving said needles in common in reciprocating motion through a base fabric to form a loop upon movement through and out of said base fabric,

a plurality of loopers, each looper being associated with a corresponding needle, means for driving said plurality of loopers in common in reciprocating motion toward and away from said plurality of needles, each said looper having a portion defining a cutting edge and a front bill which extends into the loop between the yarn and the needle when said looper drive means moves said loopers toward said needles,

a plurality of knives, each knife being associated with the cutting edge of a respective looper, means for driving said plurality of knives in common toward and away from the cutting edges of said loopers,

a control means connected to each looper for selectively extending the looper further toward its corresponding needle and the loop formed thereby a said looper drive means extends the looper alone when the control means is actuated and for retracting the looper away from the loop,

each said looper when moved to its extending position by its control means seizing the yarn loop when said control means and said looper driving means are both at their retracted positions so that the seized loop is moved to the cutting edge portion of the looper for engagement by the respective knife as said knives are moved toward the loopers by said knife drive means.

4,466,367

INTERMITTENT TOP SHIRRING ATTACHMENT FOR SEWING MACHINE

Elvin C. Price, Lawrenceville; James R. Young, Buford, and Joseph A. Bottoms, Lawrenceville, all of Ga., assignors to Atlanta Attachment Company, Lawrenceville, Ga.

Filed Oct. 8, 1982, Ser. No. 433,557

Int. Cl.³ D05B 27/12, 35/08

U.S. Cl. 112—134 **10 Claims**

1. A shirring attachment for a sewing machine of the type having a work surface, a drive motor, reciprocatable needle means driven by the drive motor, feed means at the needle means and driven by the drive motor for moving a work product across the work surface to the needle means, and a presser

foot adjacent the needle means for urging the work product downwardly toward the feed means; said shirring attachment comprising:

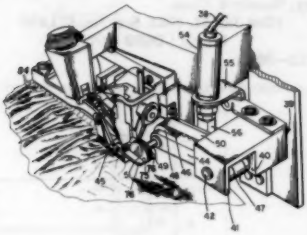
a support for mounting to the sewing machine,

a platform movably supported by said support for positioning in front of the needle means in spaced relationship with the work surface,

drive roller means mounted over said platform,

means for moving the peripheral portion of said drive roller means toward and away from engagement with said platform, and

a variable drive transmission operably connected to said



drive roller means for connection to the motor of the sewing machine for rotating said drive roller in response to the operation of the motor of the sewing machine with a peripheral velocity that corresponds to the speed of operation of the motor of the sewing machine, whereby the peripheral velocity of the drive roller means can be varied with respect to the speed of operation of the sewing machine motor,

whereby one ply of material is extended beneath the platform for movement by the feed means of the sewing machine toward the needle means and another ply of material is extended over the platform for movement by the drive roller means toward the needle means.

4,466,368

LOCK STITCHING SEWING MACHINE WITH A THREAD TIGHTENING DEVICE

Susumu Hanyu; Kazumasa Hara, and Mikio Koike, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 158,779, Jun. 12, 1980, Pat. No. 4,340,003. This application Apr. 20, 1982, Ser. No. 370,123

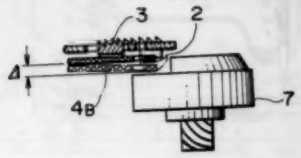
Claims priority, application Japan, Jun. 20, 1979, 54-76721

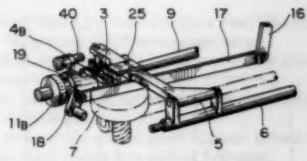
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ D05B *57/08*

U.S. Cl. 112—191 **10 Claims**

1. In a sewing machine adapted to produce zigzag stitches and straight stitches and having a main shaft adapted to vertically reciprocate a needle bar with a needle carrying an upper thread and arranged to penetrate a fabric to be sewn, a loop taker carrying a lower thread and adapted to catch a loop of the upper thread formed at the needle during the vertical reciprocating movement thereof, a drive shaft operatively connected to the main shaft for driving the loop taker, a feed dog disposed above the loop taker and adapted to transport the fabric, and a thread tightening device for tightening at least one of the upper thread and the lower thread, a combination comprising a group of pattern cams operatively connected to the main shaft to be rotated at a reduced speed for controlling the needle positions; pattern cam selecting means including at least one follower adapted to engage a selected one of the pattern cams; means for operatively connecting the selected pattern cam to the needle bar; means including a rockingly movable shaft operated in a timed relation with the main shaft to reciprocate the feed dog in a horizontal plane; means including a rotational shaft rotated in association with the main shaft to vertically reciprocate the feed dog; lower thread tightening means including an element vertically reciprocated in a timed relation with the feed dog, said element engaging the lower thread during the stitching operation of the sewing machine to draw a predetermined amount of the lower thread and tighten





the stitch to be formed; and control means for controlling the vertical reciprocating movement of said element to supply a predetermined amount of the lower thread in accordance with a needle position, during the zigzag as well as the straight stitching operation of the sewing machine.

4,466,369

CONTROL DEVICE FOR THE PRESSER MECHANISM OF A SEWING MACHINE

Ernst Dreier, Steckborn, Switzerland, assignor to Fritz Gegauf Akteingesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland

Filed Nov. 10, 1983, Ser. No. 550,533

Claims priority, application Switzerland, Nov. 18, 1982, 6716/82

Int. Cl.³ D05B *29/00*

U.S. Cl. 112—237 **5 Claims**

1. A control device for a presser mechanism of a sewing machine comprising:

an operating lever activatable in a predetermined direction for lifting and lowering the presser mechanism;

a presser bar;

a double lever;

said operating lever being operatively connected to the presser bar via said double lever;

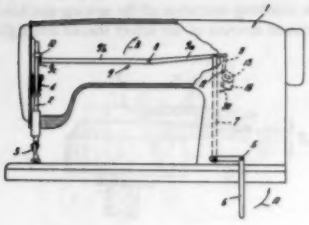
a releasable locking mechanism including an index member guided in an inherently closed, controlled cam route and being operatively engageable with a detent catch;

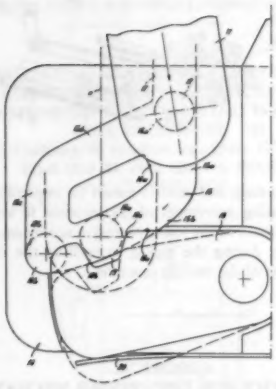
said detent catch being operatively connected to a spring-loaded swivel arm and projecting into the path of movement of the index member directly in front of a turning point of the cam route corresponding to the maximum possible lifting position of the presser mechanism;

actuating of the operating lever in a first direction for lifting the presser mechanism positions said detent catch to receive and seize the index member guided through the cam route for the purpose of locking the presser mechanism in the corresponding lifted position;

a further movement of the operating lever in the first direction overcomes the spring force acting on the swivel arm and releases said index member from the detent catch

toward the turning point of the cam route and, during the subsequent release of the operating lever, the index member returns automatically to a cam point corresponding to the lowered position of the presser mechanism.



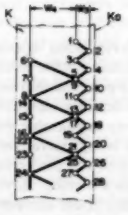


4,466,370

ZIGZAG HEMSTITCH

Yasukata Eguchi, and Susumu Hanyu, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 340,729
Claims priority, application Japan, Jan. 19, 1981, 56-4994
Int. Cl.³ D05B *1/20*
U.S. Cl. 112—269.1 **3 Claims**



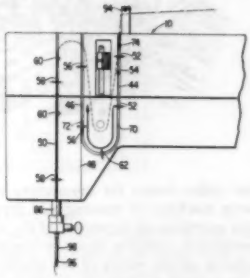
1. A method for producing hemstitches on a fabric by means of a zigzag sewing machine by forming lock stitches with an upper thread and a lower thread, wherein a series of straight stitches are formed in parallel with and spaced from the edge of the fabrics to be sewn up to connect at least two pieces of the fabrics, the method comprising the steps of forming first zigzag stitches of a predetermined width so that said first zigzag stitches extend between the edge of the fabrics and said straight stitches at a predetermined distance corresponding to said predetermined width; forming second zigzag stitches extending between said first zigzag stitches and said straight stitches, said second zigzag stitches having a number of seams on one side thereof connected to the first zigzag stitches and a number of seams on the opposite side thereof connected to said straight stitches.

4,466,371

THREADING ARRANGEMENT FOR A SEWING MACHINE

Robert H. Larsen, Middletown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 11, 1983, Ser. No. 512,850
Int. Cl.³ D05B *47/00*
U.S. Cl. 112—302 **5 Claims**



1. In a sewing machine, a bracket arm housing with a front opening, a thread tensioning module in said opening, a cover for a thread holder and cooperating take-up also in said opening, the module having parallel opposite sides, and said cover having parallel opposite sides, one of the module sides forming a first thread receiving vertical slot with the bracket arm housing and the other module side forming another vertical thread receiving slot with one of the sides of the cover, the other side of the cover forming still another vertical thread receiving slot with the bracket arm housing, said module forming a slot with the bracket arm housing interconnecting lower ends of the said first and another thread receiving slot, and said cover forming a slot with the bracket arm housing at the top of the bracket arm interconnecting the said another and still another thread receiving slots, the slot at the top of the bracket arm being disposed relative to the thread holder to provide for the movement of thread through such slot into the holder.

4,466,372

LATEEN RIGGED SAILING BOARD

Lyle L. Rudloff, 122 Highland Ave., Portsmouth, R.I. 02871

Filed May 13, 1982, Ser. No. 377,929
Int. Cl.³ B62B *3/00*; B63B *15/00*
U.S. Cl. 114—39 **2 Claims**

1. A lateen rigged sailing board comprising an elongated board having a forward and rear end with an upper and lower surface, a swivel member mounted on the upper surface near the forward end of said board, a mast, said mast having a hoop-like upper section and a substantial pole-like lower section, said lower section being affixed to the swivel member, restraining means associated with the swivel whereby the mast in a horizontal plane may swivel only in an arc of substantially 300°, a sail having a gaff and a boom meeting at a point to define a lateen configuration, said gaff passing through said hoop and being supported at the upper inner portion of the hoop-like mast portion by a halyard, said boom passing through said hoop, pivoted fastening means at the lower por-

tion of the hoop, said boom being supported at the lower inner portion of said hoop section by said pivotal fastening means

whereby the user may grasp the hoop with one hand and the boom with the other hand.

4,466,373

FOOTLOOPS ON SURFBOARDS

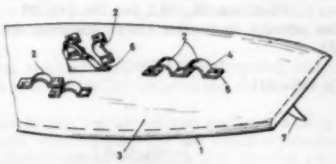
Ernstfried Prade, Weilheim, and Hans Fichtner, Sesshaupt, both of Fed. Rep. of Germany, assignors to Mistral Windsurfing A.G., Basserdorf, Switzerland

Continuation of Ser. No. 205,160, Nov. 10, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,174

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945235; Oct. 31, 1980, 3041146

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—39 **19 Claims**



1. A footloop for a windsurfing board having a deck with a top surface comprising:

a strap having opposite ends and being attached at said ends to the top surface thereby forming a loop; and

attaching means for attaching at least one of said ends to the deck which includes releasable means for holding an end portion of said strap until a certain predetermined amount of force is exerted upwardly on a portion of the strap forming the loop whereupon said strap is automatically released, said releaseable means being adjustable for differing amounts of force, said releasable means comprising:

a fixed member including a pair of upstanding members permanently affixed to the board,

a turnpin pivotally mounted between said upstanding members having an eccentric axis of rotation and a gripping face, said end portion of said strap being threadingly received and held between said gripping face and said fixed member, and

adjustable means for locking said turnpin relative to said fixed member until said certain predetermined amount of force is exerted on said strap, said adjustable means for locking being mounted in one of said upstanding members and engaging said turnpin.

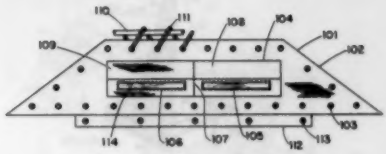
4,466,374

FABRIC WIND SHIELD AND STORAGE DEVICE FOR BOATS

Sheldon Katz, 211 Roanoke Ave., Riverhead, N.Y. 11901

Filed Sep. 28, 1982, Ser. No. 425,642

Int. Cl.³ B63B *19/02*

U.S. Cl. 114—71 **2 Claims**

1. A fabric wind shield for boats having a wind shield frame and means for supporting said frame, comprising:

(a) a first fabric sheet having a periphery which generally conforms to the wind shield frame,

(b) means for fastening the periphery of the fabric sheet to the wind shield frame,

(c) a pocket formed of a second sheet of fabric affixed along three of its edges to one face of said first sheet,

(d) flap means for covering the pocket,

(e) means for detachably securing the flap means to the pocket to provide a closure for the pocket,

(f) means for expanding the pocket in depth and breath while maintaining pocket closure, and

(g) a detachable internal divider means securing a portion of the pocket to the first fabric sheet.

4,466,375

MAST FOOT FOR SAILING BOARDS

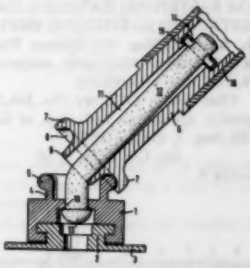
Hannes Marker, Garmish-Partenkirchen, Fed. Rep. of Germany, assignor to Hannes Marker GmbH & Co. Vertriebs K.G., Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,226

Claims priority, application PCT Int'l Appl., Oct. 24, 1980, PCT/EP80/00117

Int. Cl.³ B63B *15/00*

U.S. Cl. 114—90 **3 Claims**

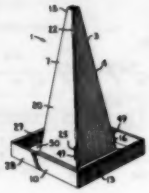


1. A mast foot for sailing boards comprising: a holder securable to a sailing board and a connector which is connected to the holder by a universal joint and can be connected to the mast, the holder and connector provided with curved faces which frictionally roll on each other during movement in all directions and which positively interengage, the holder and connector held together by an elastic tension member, and the holder on the one hand and the connector on the other hand provided with a ring having a bead-like edge and a complementary annular groove.

4,466,376
TRAFFIC CONE

Homer D. Wells, 3111 W. 6th Ave., Emporia, Kans. 66801

Filed Sep. 29, 1982, Ser. No. 428,099
Int. Cl.³ E01F 9/00
U.S. Cl. 116—63 P 4 Claims



1. A foldable traffic warning cone comprising:

(a) a first panel of generally fan shape and having four triangular faces joined at adjacent sides along respective face fold lines;

(b) said first panel having a first free side and a second free side including a flap whereby said flap engages said first free side to fold said first panel into an upright, four sided pyramid;

(c) said first panel having an apex end and a bottom end with said bottom end having fold lines with slots therein, said fold lines extending normally to the longitudinal axes of said faces, thereby forming bottom flaps; and

(d) a second panel of generally rectangular shape and comprising a base joinable with said pyramid; said second panel having four outwardly extending wings, each including a plurality of parallel fold lines and an outer wing flap portion with a tab; at least some of said wings respectively having arms protruding laterally therefrom;

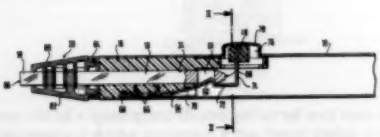
(e) said second panel having a central portion with central arms swingable upwardly therefrom to expose a central opening and fit within said pyramid and connect thereto;

(f) said wings being foldable along said parallel fold lines to trap said bottom flaps therein and form upright walls with said tabs received in said slots and with opposite end openings receiving said wing arms and connecting said walls together, thereby securing said base to said pyramid.

4,466,377
DEVICE FOR FASTENING HANDLES, ESPECIALLY TO DOMESTIC AND GARDENING IMPLEMENTS

Walter Kolb, Betzdorf/Sieg, and Helmut Weid, Niederdreisbach, both of Fed. Rep. of Germany, assignors to Wolfe-Geräte GmbH, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,194
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104228; Aug. 3, 1981, 3130703
Int. Cl.³ B25G 3/18
U.S. Cl. 16—114 R 10 Claims



1. Handling fastening device comprising:

a handle including an axially extending insert opening of non-circular cross-section that extends forwardly from an open rear end of said handle;

an insert having a cross-section corresponding to the non-circular cross-section of said opening, said insert including a steering surface at a forward end thereof and a locking recess in close proximity to said steering surface and rearward thereof;

an axially extending leaf spring located within said handle, said spring having its rear end secured to said handle, an intermediate portion defining a cam surface and disposed obliquely with respect to a longitudinal axis of said insert opening, a locking catch surface disposed forward of said cam surface and forming an angle with respect to said cam surface, and a releasing portion forward of said catch surface;

said steering surface of said insert and said cam surface of said spring cooperating in such a manner that as said insert is moved forwardly in said insert opening, said cam surface is engaged by said steering surface and causes a forward portion of said spring to deflect radially with respect to said axis and to thereby stress said spring until said catch surface and said recess are aligned, at which point said catch surface falls into said recess to lock said insert against rearward movement with respect to said insert opening;

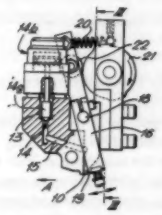
a manually operable control knob movably mounted on said handle for operatively engaging said releasing portion to deflect said spring radially in response to movement of said knob relative to said handle thereby removing said catch surface from said recess to permit said insert to be withdrawn from said recess;

said catch surface and said cam surface being disposed entirely within said handle.

4,466,378
COATING APPLICATOR HEAD

John Rogers, Nuneaton, and David J. Redfern, Weedon, both of England, assignors to Dynamelt Limited, Wolvey, England

Filed Jun. 28, 1982, Ser. No. 392,708
Claims priority, application United Kingdom, Jul. 2, 1981, 8120522
Int. Cl.³ B05C 5/02
U.S. Cl. 118—411 2 Claims



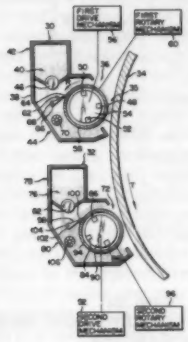
1. An applicator for applying a coating of material to a passing ribbon, comprising a head having a normally open extrusion slot disposed transverse to the direction of passage of the ribbon, means for supplying coating material to said head having portions adjacent opposite sides of the slot in continuous wiping contact with the ribbon during passing of the ribbon, a retractable finger which lies across an intermediate portion of said slot intermediate its ends, and means for repeatedly retracting said finger from across said slot and returning it to position it across said slot again, whereby said slot coats two continuous bands of material on said ribbon, which bands are spaced by the width of said finger, and a discontinuous band between and contiguous with each of said two continuous bands.

4,466,379

MAGNETIC BRUSH APPARATUS

Fuminobu Nishimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 20, 1982, Ser. No. 409,851
Claims priority, application Japan, Aug. 25, 1981, 56-132127
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—658 **2 Claims**



1. An apparatus for forming a magnetic brush which contacts a photosensitive layer, comprising:

a rotatable cylindrical sleeve which is arranged close to the photosensitive layer and which is made of a non-magnetic material;

a magnet roller arranged inside the cylindrical sleeve and having on one side thereof at least one pair of magnetic poles, said magnet roller being reversibly rotatable between a first position in which the pair of magnetic poles faces said photosensitive layer through the cylindrical sleeve and second position in which the pair of magnetic poles is separated from said photosensitive layer, said magnet roller generating a magnetic field which acts on a developer on said cylindrical sleeve to form the magnetic brush;

a driving mechanism for reversibly rotating said magnet roller between the first position and the second position; and

a scraper having a proximal end portion which is freely pivotally supported and free end which is movable from the cylindrical sleeve, said free end allowing passage of the developer, which is conveyed on a surface of said cylindrical sleeve upon moving of said magnetic poles from the second position to the first position, through a gap between said free end and said cylindrical sleeve when said scraper is separated from said cylindrical sleeve by the force of the moving developer, and said free end scraping off the developer, which is conveyed on said cylindrical sleeve upon the reverse moving of said magnetic poles from the first position to the second position, since said free end contacts said sleeve.

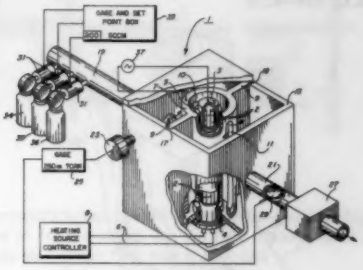
4,466,380

PLASMA DEPOSITION APPARATUS FOR PHOTOCONDUCTIVE DRUMS

Frank Jansen, Walworth, and Joseph Mort, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1983, Ser. No. 456,935
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—712 **22 Claims**

1. An apparatus for preparing amorphous silicon photoconductive devices comprising in operative relationship a rotating first electrode means, with radiant heating elements situated therein, a heating source, a hollow cylindrical drum member, containing therein the first electrode means, a second hollow counter electrode means, containing verticle slits therein, a chamber means with gas inlet means, and gas exhaust means, containing the first and second electrode means therein, a vacuum sensor means, a gauge means, a vacuum pump, a mass flow controller means, a gauge and set point box means, a



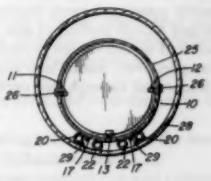
power source means for the first electrode means and the second counter electrode means, and gas pressure vessels, wherein a silane gas is introduced into the chamber means in a crossflow direction perpendicular to the axis of the cylindrical member.

4,466,381

COATING OF SEMICONDUCTOR WAFERS AND APPARATUS THEREFOR

George M. Jenkins, Dunrobin, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 250,163, Apr. 2, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 508,411
Claims priority, application Canada, Jan. 14, 1981, 368517
Int. Cl.³ H01L *21/68*
U.S. Cl. 118—728 **23 Claims**



1. Apparatus for producing coatings on semiconductor wafers with reduced fringing, including a boat for carrying said wafers, said boat comprising:

an elongate semi-cylindrical quartz member having top edges and open ends;

a top rail extending along each top edge of the quartz member, the rails extending inward;

a central rail extending along the inside of the quartz member at the bottom, the rail extending upwards;

slots in said top rails and said central rail to hold said wafers at desired spacings, said slots at predetermined intervals;

said slots in said central rail having bottom surfaces at a height to hold said wafers at a predetermined height above the bottom of the boat;

transverse slots in said quartz member for enabling the flow of gases substantially radially up into said boat;

an imperforate cover member positioned over said boat such that excess gases flow out of said open ends of said boat.

4,466,382

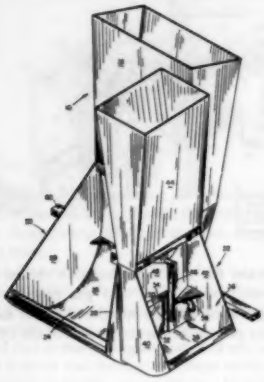
PIG AND SOW FEEDER

Ora H. Babbitt, and Garvin G. Babbitt, both of Rte. 1, Avoca, Iowa 51521

Filed Jun. 29, 1983, Ser. No. 508,842

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—52 R **6 Claims**



1. A pig and sow feeder comprising, a pig feeder unit including a lower trough portion and a

hopper means positioned thereabove adapted to supply feed thereto, and a sow feeder unit including a lower trough portion and a

hopper means positioned thereabove adapted to supply feed thereto, said trough portions of said sow and pig feeder units being

disposed relative to each other so that the trough portion of said pig feeder unit is directed toward the creep area of a farrowing pen and so that said trough portion of said sow feeder unit may be positioned in the farrowing crate portion of a farrowing pen,

said trough portion of said pig feeder unit having a selectively closable opening formed therein which communicates with said trough portion of said sow feeder unit so that unused feed in said trough portion of said pig feeder unit may be selectively passed into said trough portion of said sow feeder unit through said opening.

4,466,383

BOILER CLEANING OPTIMIZATION WITH FOULING RATE IDENTIFICATION

John H. Klatt, Laurel, Md., and Theodore N. Matsko, Chesterland, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 12, 1983, Ser. No. 541,394

Int. Cl.³ F22B *37/48*

U.S. Cl. 122—379 **4 Claims**

1. A method of optimizing the scheduling time for sootblowing in one of a plurality of heat traps in boiler, comprising:

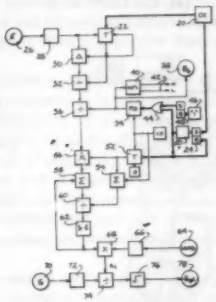
Obtaining a fixed cost value S corresponding to the cost of running a sootblowing operation for the heat trap;

calculating the average slope (a) for a loss of efficiency during a period between sootblowing operations for the heat trap;

determining the length (θ_c) for a sootblowing operation of the heat trap; and

calculating the optimum duration between sootblowing operations (θ_{opt}) according to the relationship:

$$\theta_{opt} = \sqrt{\theta_c^2 + \frac{2S\theta_c}{a}} - \theta_c$$



4,466,384

ARRANGEMENT FOR COOLING A GAS PRODUCED IN A GASIFIER

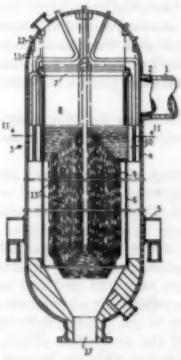
Erich Maurer, Oberhausen; Aruth Rafael, Wesel, and Heinrich Wefing, Mülheim, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Anlagen Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,943

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208421

Int. Cl.³ F22B *37/52;* **F22D** *1/00*

U.S. Cl. 122—392 **14 Claims**



1. Arrangement for cooling a product gas produced in a gasifier, comprising a radiation means and convection means connected to said radiation means; said radiation means and convection means being located separate from said gasifier; a pressure vessel with an insert arranged spaced from a wall of said pressure vessel in each said radiation means and said convection means; the insert in said radiation means being formed of pipes welded gas-tightly together; said radiation means being separate from the gasifier and being connected to the gasifier by a pipe conduit communicating with the respective insert through a gas inlet; each insert being arranged removably in the pressure vessel; free stabilization space means, and cooled platen heating surfaces arranged in the flow direction of the product gas behind said stabilization space means, said platen heating surfaces being located within the insert of said radiation means in the region of said gas inlet; said platen heating surfaces extending over only a part of the insert; soot

blowers located horizontally and perpendicular to the platen heating surfaces and passing through a wall and inner space of the insert of the pressure vessel in said radiation means, said soot blowers comprising a blow pipe surrounded at a distance by a jacket pipe, a cooling agent being passed through the intermediate space between the jacket pipe and the blow pipe, said platen heating surfaces being mounted on the jacket pipe.

14. Arrangement for cooling a product gas produced in a gasifier, comprising a radiation means and convection means connected to said radiation means; said radiation means and convection means being located separate from said gasifier; a pressure vessel with an insert arranged spaced from a wall of said pressure vessel in each said radiation means and said convection means; the insert in said radiation means being formed of pipes welded gas-tightly together; said radiation means being separate from the gasifier and being connected to the gasifier by a pipe conduit communicating with the respective insert through a gas inlet; each insert being arranged removably in the pressure vessel; free stabilization space means, and cooled platen heating surfaces arranged in the flow direction of the product gas behind said stabilization space means, said platen heating surfaces being located within the insert of said radiation means in the region of said gas inlet; said platen heating surfaces extending over only a part of the insert; said radiation means having a side inlet pipe connection in its upper part, the insert of said radiation means being closed by a lid above said stabilization means, said lid being formed by cooled pipes which are welded gas-tightly together; said insert of said radiation means being suspended in the pressure vessel; suspensions connected to said lid, said lid being removable; supplies to the pipes of said radiation means and suspensions being arranged between a ceiling of the insert and said lid; said insert of the pressure vessel in said radiation means being flattened on at least one side with an increase of the distance to the wall of the pressure vessel; said platen heating surfaces being arranged parallel to each other and to the longitudinal axis of the insert; pipes of said platen heating surfaces being passed through the insert and terminating in collectors between the insert and wall of the pressure vessel in said radiation means; soot blowers located horizontally and perpendicular to said platen heating surfaces and passing through a wall and inner space of the insert of the pressure vessel in said radiation means, said soot blowers comprising a blow pipe surrounded at a distance by a jacket pipe, a cooling agent being passed through the intermediate space between the jacket pipe and the blow pipe, said platen heating surfaces being mounted on said jacket pipe; further cooled soot blowers arranged in longitudinal direction of the insert in said radiation means and on a wall of said insert in said radiation means; the insert of said convection means being supported on the pressure vessel.

4,466,385

SUPPORT FOR IN-BED HEAT EXCHANGER

Richard E. Waryasz, Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 3, 1983, Ser. No. 538,455
Int. Cl.³ F22B *37/24*
U.S. Cl. 122—510 **4 Claims**

1. A support structure for an in-bed heat exchanger of a combusting fluidized bed, including,

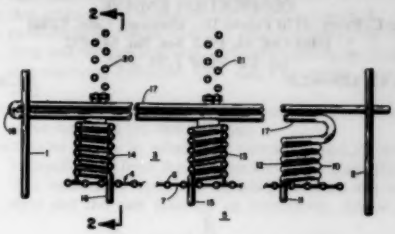
a horizontal support plate for the fluidized bed,

vertical bed-retaining walls at the edges of the horizontal plate,

a first heat exchange tube extending upward through the horizontal plate spiraled to form a load-bearing pillar extending from the upper surface of the horizontal plate,

a supply of cooling fluid mounted below the support plate and connected to supply the first heat exchange tube,

a second heat exchange tube formed into a heat exchanger within the fluidized bed and mounted on the top of the pillar formed by the first heat exchange tube,



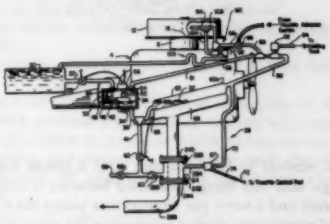
and a connection between the first and second heat exchange tubes to form a circuit for the fluid flowing from the supply up through both heat exchangers.

4,466,386

SYSTEM AND METHOD OF VAPORIZING LIQUID FOR DELIVERY TO AN INTERNAL COMBUSTION ENGINE

Robert E. Silva, 6452 N. 8th St., Fresno, Calif. 93710

Filed Dec. 28, 1981, Ser. No. 335,067
Int. Cl.³ F02M *25/02*
U.S. Cl. 123—25 B **22 Claims**



1. For use with an internal combustion engine having a carburetor with an air intake, low pressure/low temperature vapor generating apparatus comprising

a source of liquid,

means for heating the liquid from the source to convert it to vapor,

means for delivering the vapor from the heating means to the air intake of the carburetor,

pressure relief means coupled into said delivering means for operating to vent the delivering means when the pressure therein exceeds a predetermined level, to thereby maintain the pressure in the delivering means at or below the predetermined level, and

means for conveying to the liquid source, vapor which has been vented by the pressure release means.

14. A method of introducing low pressure/low temperature vapor into the air stream intake of a carburetor of an internal combustion engine comprising

providing a source of liquid,

heating liquid received from the source to convert it to vapor,

delivering the vapor to the air stream intake of the carburetor,

maintaining the pressure of the delivered vapor at or below some predetermined level,

controlling the volume of water heated at any particular time so that it does not exceed a certain amount, and

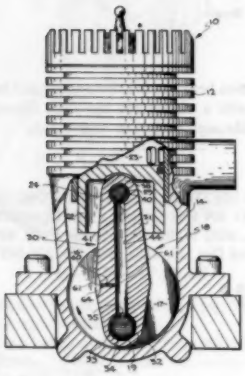
substantially equalizing the pressure of the delivered vapor with the pressure at the controlling step.

4,466,387

LUBRICATION MEANS FOR A TWO-CYCLE INTERNAL COMBUSTION ENGINE

John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008

Filed Oct. 14, 1983, Ser. No. 541,952
Int. Cl.[3] F01P 1/04, 3/06
U.S. Cl. 123—41.37 9 Claims



1. A method to lubricate and cool a piston rod and rod bearings, said rod being connected between a crankpin of a crankshaft and a wrist pin secured to a piston for a two-cycle internal combustion engine comprising the steps of:

forming a longitudinally extending bore within said rod, said bore communicates between said crankpin at a first end of said rod and said wrist pin at a second end of said rod,

forming an interconnecting passage means in said rod that communicates between said longitudinally extending bore and a crankcase chamber formed by and within an engine block of said two-cycle engine,

forming an inlet trough in said rod at an entrance to said passage means communicating between said crankcase chamber and said longitudinal bore formed in said rod, said passage means being about transverse to the axis of the bore in the rod, said passage means further being located on the left-hand side of the rod when said rod rotates in a clockwise direction,

injecting a combustible mixture of fuel and oil within said crankcase chamber from a source of said fuel and oil communicating with said chamber, and

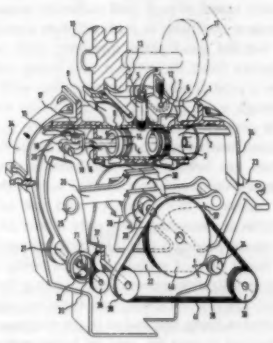
collecting said mixture of fuel and oil entrained within said chamber through said interconnecting passage in said rod communicating between said longitudinally extending bore in said rod and said chamber, said fuel and oil enters said bore in said rod and exits through a crankpin rod bearing and a wrist pin rod bearing as said rod reciprocates with said piston and rotates around said crankshaft through said crankpin from about a three o'clock position to about a nine o'clock position as said crankshaft rotates clockwise thereby admitting fuel and oil into said bore within said rod to lubricate said crankpin and wrist pin bearings and to cool said rod during engine operation.

4,466,388

COMPRESSION IGNITION INTERNAL COMBUSTION ENGINE

Donald W. Tryhorn, Slough, England, assignor to Sir W. G. Armstrong Whitworth & Company, Ltd., Berkshire, England

Filed Mar. 2, 1982, Ser. No. 354,103
Claims priority, application United Kingdom, Dec. 23, 1981, 8138678
Int. Cl.[2] F01B 7/12
U.S. Cl. 123—51 BB 5 Claims



1. A compression ignition engine comprising:

a main engine frame;

engine mounting brackets disposed adjacent said main engine frame;

a layer of resilient jointing material interposed said main engine frame and said engine mounting brackets such that said main engine frame is supported by said engine mounting brackets through said layer of resilient jointing material;

a cylinder mounted to said main engine frame;

a pair of axially aligned pistons reciprocally mounted in said cylinder;

a strut member being integral with and interposed said engine mounting brackets;

a crankshaft mounted to said strut member;

connecting means for connecting each of said pair of axially aligned pistons to said crankshaft, said connecting means further comprising at least one rocker beam having respectively one end coupled to one of said pair of axially aligned pistons, an opposite end coupled to said strut member, and a central portion between said one end and said opposite end communicating with said crankshaft, said opposite end of each of said at least one rocker beam further acting as a fulcrum point having an axis such that a predetermined portion of the balancing force is translated to said strut member, said opposite end of each of said at least one rocker beam having a mass constrained to revolve around said axis of said fulcrum point so as to counteract an unbalancing force directed along said at least one rocker beam; and

a shaft having a central axis coaxially disposed with said axis of said fulcrum point; an arm mounted to said shaft for rotation therewith; an annular race coaxially disposed with said shaft; and gear train means attached at one end to said shaft and at another opposite end communicating with said crankshaft whereby said mass is revolvable in said annular race by impulsion of said arm which is rotatable by said gear train means and said crankshaft.

4,466,389

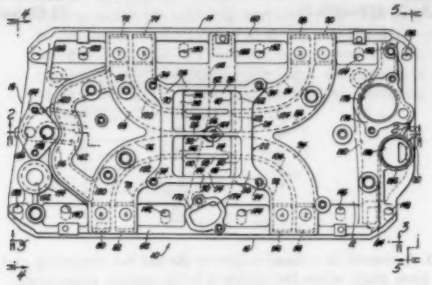
INTAKE-MANIFOLD

Zora Arkus-Duntov, Grosse Pointe, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Continuation of Ser. No. 93,112, Nov. 13, 1979, abandoned. This application Sep. 14, 1982, Ser. No. 418,042

Int. Cl.³ F02B *27/00*

U.S. Cl. 123—52 MB **7 Claims**



1. An intake manifold for an internal combustion engine, comprising riser structure means, first and second plenum chamber means at least partly defined within the interior of said riser structure means, first induction passage means, said first induction passage means communicating at one end thereof with said first plenum chamber means and extending therefrom as to terminate in first outlet port means for operative connection to said engine, second induction passage means, said second induction passage means communicating at one end thereof with said second plenum chamber means and extending therefrom as to terminate in second outlet port means for operative connection to said engine, first passage connection means situated generally internally of said riser structure means and effective for operatively interconnecting said first and second plenum chamber means with a source of exhaust gases of said engine for induction and recirculation of at least a portion thereof, and second passage connection means, said second passage connection means being situated externally of said riser structure means and having its opposite ends in communication with said first and second plenum chamber means respectively and separately from said first passage connection means, wherein said first induction passage means comprises at least first and second induction passages, wherein said first outlet port means comprises at least first and second outlet ports, wherein said first and second induction passages respectively terminate in said first and second outlet ports, wherein said second induction passage means comprises at least third and fourth induction passages, wherein said second outlet port means comprises at least third and fourth outlet ports, and wherein said second passage connection means communicates with said first and second plenum chamber means by having said opposite ends thereof respectively communicating directly and only with said first and third induction passages.

4,466,390

ELECTRO-HYDRAULIC VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE VALVES

Rudolf Babitzka, Kirchberg; Wilhelm Polach, Möglingen, and Walter Schlagmüller, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,346

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135650

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.16 **10 Claims**

1. Valve control system for an internal combustion engine having

a camshaft (2, 3);

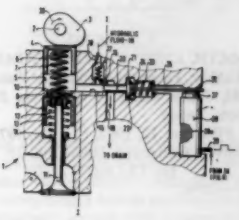
a valve stem (11);

a cam follower (4) in engagement with the camshaft;

a mechanical-hydraulic coupling means coupling the valve stem and the cam follower, including a hydraulic pressure line receiving hydraulic fluid, and a hydraulic drain line (19);

means (5, 6, 9) for providing hydraulic coupling between the valve stem and the cam follower;

and valve means to selectively permit or inhibit flow of hydraulic fluid from the pressure line to the drain line and thus establish a hydraulic coupling between the valve stem and the cam follower or, selectively, release said



coupling upon permitting hydraulic fluid to drain to the drain line,

wherein, in accordance with the invention,

said valve means comprises an electrically controlled valve (20, 38);

the electrically controlled valve includes a valve slider (20, 25);

and electrically controlled clamping means (26, 27, 28) are provided, positioned in clamping relation with respect to said valve slider to permit or inhibit sliding movement of said slider, selectively, in accordance with the state of energization of said electrically controlled clamping means.

4,466,391

STARTING AIDS FOR INTERNAL COMBUSTION ENGINES

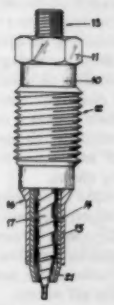
Kenneth Page, Sheldon, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Sep. 3, 1982, Ser. No. 414,592

Claims priority, application United Kingdom, Sep. 23, 1981, 8128714

Int. Cl.³ F23Q *7/22*; F02P *19/02*

U.S. Cl. 123—145 A **9 Claims**



1. An electric starting aid for use in a combustion chamber of a compression ignition engine and comprising a body part

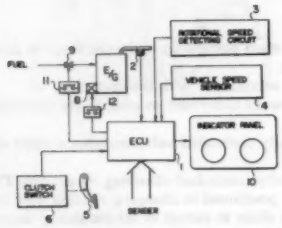
mounting a terminal assembly, a tubular extension carried by the body part, the end of the extension remote from the body part being exposed in use within the combustion chamber, a coiled electric heating element formed by a length of conductive tape located at said end of the extension and an electrically conductive rod extending within the extension to said end thereof, said rod having a free end and being electrically connected to one end of the tape forming the heating element and to said terminal assembly, the other end of the tape forming the heating element being electrically connected to said extension, said rod having a tapered portion adjacent said end of the extension and said heating element being wound from the free end of the rod in helical overlapping relationship along at least part of said tapered portion of the rod.

4,466,392

AUTOMATIC ENGINE STOP-RESTART SYSTEM

Shigekatsu Uchida; Takao Akatsuka, and Takahide Kawamura, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 12, 1982, Ser. No. 397,180
Claims priority, application Japan, Jul. 22, 1981, 56-114575
Int. Cl.³ F02N *11/08*
U.S. Cl. 123—179 G **11 Claims**



1. An automatic engine stop-restart system wherein the operating conditions of various parts in a vehicle are detected, and the engine is automatically stopped and restarted on the basis of the results thus detected, comprising an electronic control circuit, means for detecting engine rotational speed, fuel cut-off means for cutting off fuel to said engine, starter actuating means for activating a starter of said engine, and additional detecting means for detecting predetermined additional conditions for allowing the automatic stop or automatic restart,

said additional detecting means comprising means for detecting vehicle speed and for inputting said vehicle speed to said electronic control circuit,

said means for detecting engine rotational speed comprising means for maintaining an ignition system of said engine continuously energized during automatic stop and restart and means for feeding an ignition signal from said ignition system to said electronic control circuit when and only when said ignition system is energized,

said electronic control circuit having an output connected to said fuel cut-off means and an output connected to said starter actuating means,

said electronic control circuit comprising means for controlling said fuel cut-off means to cut off fuel, on condition that the vehicle speed is zero and said predetermined additional conditions for allowing the automatic stop are met, and for continuously sampling said ignition signal after said fuel cut-off occurs,

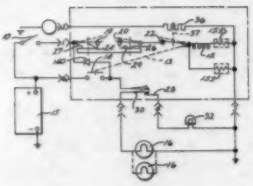
said electronic control circuit further comprising means for controlling said starter actuating means for activating said starter when and only when said ignition signal indicates that the engine rotational speed is zero.

4,466,393

THERMAL SWITCH-OPERATED GLOW PLUG CONTROL DEVICE FOR DIESEL ENGINES

Lon E. Bell, Altadena, Calif., assignor to Technar Incorporated, Arcadia, Calif.

Continuation of Ser. No. 317,121, Nov. 2, 1981, abandoned. This application Jan. 4, 1984, Ser. No. 568,280
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—179 H **11 Claims**



1. A control for a diesel engine or the like for energizing a set of glow plugs when the engine is being started, comprising:

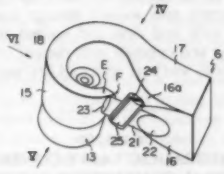
at least one controller including a temperature actuated switch having normally closed contacts that are opened with a rise in temperature, said temperature actuated switch including a bimetal element, the normally closed contacts being opened by movement of the bimetal element with increase in temperature above a predetermined level, the bimetal element and temperature actuated switch being connected electrically in series, current through the switch flowing through the bimetal element to produce resistance heating of the bimetal element to open the contacts, and a power relay connecting the set of glow plugs to an electrical power source and having a coil connected in series with the temperature actuated switch and the associated bimetal element across a current source, the temperature actuated switch, when opened, interrupting current flow through the bimetal element and the relay coil.

4,466,394

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

Katsuhiko Motosugi; Masatami Takimoto, both of Toyota, and Ituo Koga, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 16, 1982, Ser. No. 369,025
Claims priority, application Japan, Apr. 24, 1981, 56-61424
Int. Cl.³ F02B *31/00*; F02M *35/10*
U.S. Cl. 123—188 M **13 Claims**



1. A device for controlling the flow in a helically-shaped intake port of a cylinder head of an internal combustion engine in order to increase the volumetric efficiency of the engine, said intake port comprising a helical portion around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage entirely within said cylinder head, said bypass passage having one end directly connected to the inlet passage portion and its other end opening into an

upper end of the helix terminating portion of the helical portion such that the flow into the upper end of the helix terminating portion from the bypass portion is in a direction opposite to a swirl flow in the helix terminating portion:

a normally closed rotary valve arranged in said bypass passage for controlling the flow area of said bypass passage; and

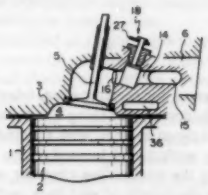
actuating means for actuating said rotary valve in response to the change in the amount of air fed into the intake port to open said rotary valve when said amount of air is increased beyond a predetermined value, the opening of the valve reducing the swirl flow and thereby increasing the volumetric efficiency.

4,466,395

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

Shinichi Kato; Yoshihiko Dohi; Katsuhiko Motosugi, all of Toyota, and Ituo Koga, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 23, 1982, Ser. No. 391,378
Claims priority, application Japan, Jun. 29, 1981, 56-99737
Int. Cl.³ F02B *31/00*; F02M *35/10*
U.S. Cl. 123—188 M 19 Claims



1. A device for controlling the flow in a helically-shaped intake port of a cylinder head of an internal combustion engine in order to increase the volumetric efficiency of the engine, said intake port comprising a helical portion around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage entirely within said cylinder head, said bypass passage having one end directly connected to the inlet passage portion and its other end opening into an upper end of the helix terminating portion of the helical portion such that the flow into the upper end of the helix terminating portion from the bypass portion is in a direction opposite to a swirl flow in the helix terminating portion;

a normally closed rotary valve arranged in said bypass passage for controlling the flow area of said bypass passage;

a cooling water passage arranged beneath and near the bottom wall of said bypass passage; and

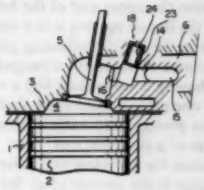
actuating means for actuating said rotary valve in response to the change in the amount of air fed into the intake port to open said rotary valve when said amount of air is increased beyond a predetermined value, the opening of the valve reducing the swirl flow and thereby increasing the volumetric efficiency.

4,466,396

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

Kiyoshi Nakanishi, Susono, and Ituo Koga, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 23, 1982, Ser. No. 391,390
Claims priority, application Japan, Jun. 29, 1981, 56-99736
Int. Cl.³ F02B *31/00*; F02M *35/10*
U.S. Cl. 123—188 M 19 Claims



1. A device for controlling the flow in a helically-shaped intake port of a cylinder head of an internal combustion engine in order to increase the volumetric efficiency of the engine, said intake port comprising a helical portion around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage entirely within said cylinder head, said bypass passage having one end directly connected to the inlet passage portion and its other end opening into an upper end of the helix terminating portion of the helical portion such that the flow into the upper end of the helix terminating portion from the bypass portion is in a direction opposite to a swirl flow in the helix terminating portion;

a normally closed flow control valve transversely movable in said bypass passage for controlling the flow area of said bypass passage, said flow control valve having bellows therein and being actuated by said bellows; and

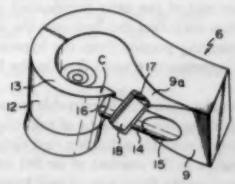
actuating means for actuating said bellows in response to the change in the amount of air fed into the intake port to open said flow control valve when said amount of air is increased beyond a predetermined value, the opening of the valve reducing the swirl flow and thereby increasing volumetric efficiency.

4,466,397

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

Shinichi Kato; Katsuhiko Motosugi; Kiyoshi Isogai, all of Toyota; Ituo Koga, Okazaki, and Naka Takita, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 25, 1982, Ser. No. 392,294
Claims priority, application Japan, Jun. 30, 1981, 56-96027[U]
Int. Cl.³ F02B *31/00*; F02M *35/10*
U.S. Cl. 123—188 M 20 Claims



1. A device for controlling the flow in a helically-shaped

intake port of a cylinder head of an internal combustion engine in order to increase the volumetric efficiency of the engine, said intake port comprising a helical portion around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass entirely within said cylinder head, bypass passage having one end directly connected to the inlet passage portion and its other end opening into an upper end of the helix terminating portion of the helical portion such that the flow into the upper end of the helix terminating portion from the bypass portion is in a direction opposite to a swirl flow in the helix terminating portion;

a normally closed rotary valve arranged in said bypass passage and having a valve shaft and a valve body which is formed in one piece on said valve shaft and extends across said bypass passage, said valve shaft and said valve body being made of a polymer; and

actuating means for actuating said rotary valve in response to the change in the amount of air fed into the intake port to open said rotary valve when said amount of air is increased beyond a predetermined value, the opening of the valve reducing the swirl flow and thereby increasing the volumetric efficiency.

4,466,398

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

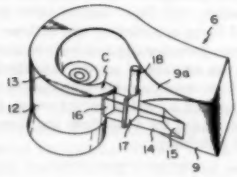
Kiyoshi Nakanishi; Takeshi Okumura, both of Susono, and Tokuta Inoue, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 21, 1982, Ser. No. 400,358

Claims priority, application Japan, Jul. 31, 1981, 119319

Int. Cl.³ F02B *31/00*; F02M *35/10*

U.S. Cl. 123—188 M **17 Claims**



1. A device for controlling the flow in a helically-shaped intake port of a cylinder head of an internal combustion engine in order to increase the volumetric efficiency of the engine, said intake port comprising a helical portion around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage entirely within said cylinder head, said bypass passage having one end directly connected to the inlet passage portion and its other end opening into an upper end of the helix terminating portion of the helical portion such that the flow into the upper end of the helix terminating portion from the bypass portion is in a direction opposite to a swirl flow in the helix terminating portion;

a slide valve tranversely movable in said bypass passage for controlling the flow area of said bypass passage; and

actuating means for actuating said slide valve in response to a change in the amount of air fed into the intake port for increasing the flow area of said bypass passage in proportion to an increase of said amount of air, the opening of the valve reducing the swirl flow and thereby increasing the volumetric efficiency.

4,466,399

PISTON-CYLINDER SET FOR RECIPROCATING INTERNAL-COMBUSTION ENGINES, ESPECIALLY OTTO AND DIESEL ENGINES

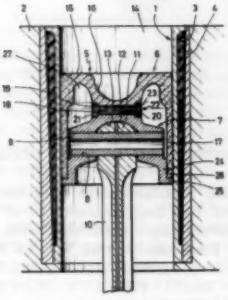
Bernhard Hinz, Frankfurt, and Richard Kochendörfer, Stuttgart, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,461

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134768

Int. Cl.³ F02F *3/04*

U.S. Cl. 123—193 CP **8 Claims**



1. Piston-cylinder set for reciprocating, internal combustion engines with a cylinder block having a combustion chamber, especially Otto and diesel engines, with a cylinder liner having an interior bearing surface and located in the cylinder block and a piston facing the combustion chamber supported movably therein along the length of said liner and along its own longitudinal axis, said piston containing a rotational bearing for a connecting rod employing a piston pin held within the piston and incorporating a spherical pressure pad in the piston that contacts two-dimensionally a corresponding spherical pressure pad on the connecting rod, characterized by

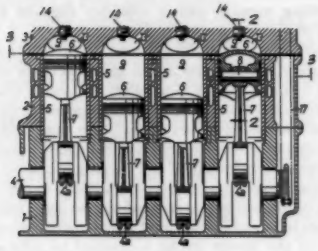
a band (3) surrounding the cylinder liner (1) that consists of a fiber composite whose thermal expansion in a radial direction is less than that of the cylinder liner (1) to impede expansion of the latter, said band (3) varying in thickness over the length of the cylinder liner (1); the piston consisting of a cap (6), with a piston head (15) facing said combustion chamber (14) and an essentially cylindrical piston skirt (17) adjacent to said cylinder bearing surface, and a force-transmitting core (7) that contains said bearing for said piston pin (9) and said spherical pressure pad (13); a force-transmitting connection above the spherical pressure pad (13) and between piston head (15) and force-transmitting core (7), said force-transmitting connection being rotationally symmetrical to said piston's longitudinal axis; cap (6) being connected at a lower rim (26) of piston skirt located below said bearing (17) to force-transmitting core (7), no contact existing otherwise between cap (6) and force-transmitting core (7) except at the force-transmitting connection; and both cylinder liner (1) and cap (6) consisting of a ceramic material.

4,466,400

INTERNAL COMBUSTION ENGINE

Shoichiro Irimajiri, Saitama, and Shoichi Honda, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 175,390, Aug. 5, 1980, abandoned. This application Dec. 21, 1982, Ser. No. 451,848
Claims priority, application Japan, Aug. 7, 1979, 54-100467
Int. Cl.³ F02F *3/28*
U.S. Cl. 123—193 P **8 Claims**



1. An internal combustion engine comprising

a cylinder, oblong in cross section;

a crankshaft mounted at a right angle to the major cross-sectional dimension of said oblong cylinder;

a cylinder head closing said oblong cylinder;

an intake poppet valve in said cylinder head adjacent one end of said oblong cylinder in communication with said oblong cylinder and having an intake valve head, an intake valve stem and a longitudinal axis through said intake valve head and said intake valve stem;

an exhaust poppet valve in said cylinder head adjacent the other end of said oblong cylinder in communication with said cylinder and having an exhaust valve head, an exhaust valve stem and a longitudinal axis through said exhaust valve head and said exhaust valve stem, said valve axes being symmetrically inclined outwardly in the direction of the major cross-sectional dimension of said oblong cylinder, said cylinder head including a concave surface with a first, centerline element thereof in the direction of the major cross-sectional dimension of said oblong cylinder having a constant radius of curvature substantially greater than one half the minor cross-sectional dimension of said oblong cylinder and a second, centerline element thereof in the direction of the minor cross-sectional dimension of said oblong cylinder having a constant radius of curvature greater than one-half the minor cross-sectional dimension of said oblong cylinder, said longitudinal axes of said valves being normal to said surface along said first centerline element; and

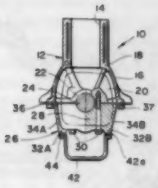
a piston, oblong in cross section and mounted to slide in said cylinder, said piston having a convex domed piston head with third and fourth, centerline elements thereof in the direction of the major and minor cross-sectional dimensions of said oblong cylinder with each having a constant radius of curvature substantially greater than the radius of curvature of said first and second, centerline elements of said cylinder head surface, respectively.

4,466,401

INTERNAL COMBUSTION ENGINE WITH BEARING BEAM STRUCTURE

Naoki Ogawa, and Kazuyuki Fujigaya, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 11, 1982, Ser. No. 338,517
Claims priority, application Japan, Jan. 19, 1981, 56-5541[U]
Int. Cl.³ F16F *15/00*; F02F *1/00*
U.S. Cl. 123—195 H **7 Claims**



1. An internal combustion engine comprising:

a cylinder block including a skirt section, and a plurality of bearing sections integrally connected to said skirt section; and

a bearing beam structure secured to the bottom part of said cylinder block and including:

a plurality of main bearing cap sections, each of which associates with one of said cylinder block bearing sections to rotatably support the journal of a crankshaft, each of said main bearing cap sections having along its periphery opposite side portions,

first and second side wall sections disposed to securely connect said bearing cap sections with each other, said first and second side wall sections being integrally connected respectively to said opposite side portions of each bearing cap section along the periphery thereof and, said first and second side wall sections being connected at their top part with the lower part of said cylinder block skirt section,

first and second beam sections disposed to securely connect said main bearing cap sections with each other, said first and second beam sections extending parallel with the axis of the crankshaft and being positioned along respective opposite side portions of each bearing cap section, and first and second beam sections being integrally connected with bottom parts of said first and second side wall sections, respectively, and projecting inwardly from said first and second side wall sections in a manner so that the distance between said first and second beam sections is smaller than that between said first and second side wall sections and the first and second side wall sections are angled so as to converge in a direction towards said beam sections.

4,466,402

AUTOMATIC SWITCH ASSEMBLY

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Suroff, Jericho, N.Y., a part interest

Filed Sep. 15, 1983, Ser. No. 532,401
Int. Cl.³ F02B *77/08*
U.S. Cl. 123—196 S **23 Claims**

1. A pressure activated switch for use in series in the lubricating fluid flow path of a motor, comprising:

A. a housing having a top end and a bottom end with an axially extending chamber extending between said ends and a vertically extending wall defining the periphery of said chamber,

B. an inlet port communicating with said chamber,

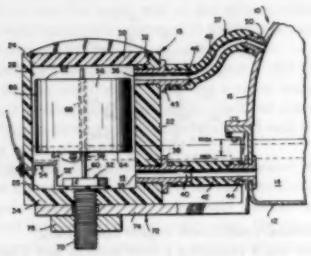
C. an outlet port communicating with said chamber in vertically spaced relationship to said inlet port so as to obtain a flow of fluid from the motor between said ports, such

that the level of fluid in said chamber is directly related to the level of fluid associated with the motor,

D. a first electrical terminal extending from said bottom end into said chamber,

E. a second electrical terminal extending into said chamber,

F. element means carried by said first electrical terminal and fluctuating with the level of fluid within said chamber, said element means completing a current path between said first and second electrical terminals when the fluid in



said chamber is at a level below which the motor should continue to operate, and

G. means serially connected in said current starting path of said motor, said means normally completing said current starting path, and being responsive to said completing of a current path between said first and second terminals, and upon said completing of said path between said first and second terminals, opening said current starting motor path causing said motor to stop operating.

4,466,403

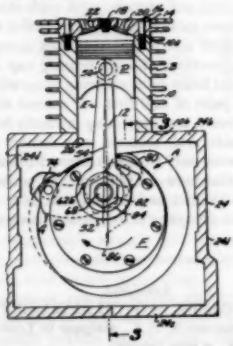
SWING THROW CRANK STRUCTURE

Jack K. Menton, 1611 Peacock Blvd., Oceanside, Calif. 92056

Filed Dec. 20, 1982, Ser. No. 451,286

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—197 AC **4 Claims**



1. An improved swing throw crank structure in combination with an internal combustion engine that includes a piston, a cylinder in which said piston reciprocates, a piston rod pivotally connected to said piston, said piston rod including a journal, and a drive shaft rotatably supported in a fixed position relative to said cylinder for transforming reciprocating movement of said piston to rotary motion of said drive shaft, said swing throw crank structure including:

a. first and second parallel, laterally spaced rotor plates that are co-axially aligned, said first rotor plate having an arcuate slot extending within a side surface thereof most adjacent said second rotor plate, said second rotor plate having an arcuate opening therein transversely aligned with said slot, said first rotor plate secured to said drive shaft, said slot and opening each partially defined by a force receiving edge of said first and second rotor plates;

b. first means for maintaining said first and second rotor plates in fixed laterally spaced relationship;

c. a force transmitting assembly at least partially disposed between said first and second rotor plates that include an elongate rigid body that has first and second end portions, a first arcuate force transmitting member projecting rearwardly from said body that slidably engages said slot, a second arcuate force transmitting member that projects forwardly from said body and slidably engages said opening, and first and second transversely spaced cam rollers rotatably supported from said first and second end portions of said body;

d. a stub shaft that extends outwardly from said second force transmitting member and is rotatably engaged by said journal of said connecting rod; and

e. first and second generally elliptical, transversely spaced, cam surface defining means that are at all times engaged by said first and second cam rollers and are so related to said force transmitting assembly that a power stroke only starts as said piston moves through top dead center and said second force transmitting member and the portion of said force receiving edge of said opening in contact therewith have moved to a position substantially to one side of the axis of rotation of said first and second rotor plates and continues to be so disposed until substantially bottom dead center on the power stroke is reached to substantially increase the torque delivered to said drive shaft in the rotation thereof over that attained when a conventional crank is employed to rotate a drive shaft.

4,466,404

SPLIT ENGINE

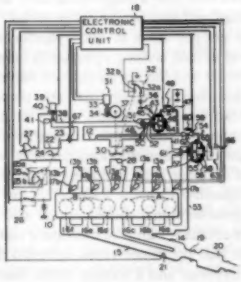
Makoto Ueno, Shizuoka, and Kohei Hori, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 9, 1983, Ser. No. 464,783

Claims priority, application Japan, Oct. 18, 1982, 57-181459

Int. Cl.³ F02D *17/02*

U.S. Cl. 123—198 F **17 Claims**



1. A split engine having a plurality of cylinders which are divided into a first cylinder group and a second cylinder group, said engine comprising:

a first intake passage having an inlet and an outlet connected to said first cylinder group;

a second intake passage having an inlet and an outlet connected to said second cylinder group, the inlet of said first intake passage being connected to said second intake passage and the inlet of said second intake passage being open to the outside air;

an exhaust passage connected to said first cylinder group;

a manually operated throttle valve arranged in the inlet of said second intake passage;

detecting means for detecting the level of the load of the engine and for producing an output signal;

electronic control means for producing control signals in response to the output signal of said detecting means;

fuel supply means, actuated in response to a control signal of said electronic control means, for feeding fuel into only said second cylinder group when the level of the load of the engine is lower than a predetermined level and for feeding fuel into both of said cylinder groups when the level of the load of the engine is higher than the predetermined level;

an exhaust-gas recirculation passage interconnecting said exhaust passage to said first intake passage;

a recirculation control valve, arranged in said exhaust-gas recirculation passage, for controlling the flow area of said exhaust-gas recirculation passage;

first actuating means operated in response to a control signal of said electronic control means and opening said recirculation control valve when the level of the load of the engine is lower than the predetermined level;

a shut off valve, arranged in the inlet of said first intake passage, for controlling the flow area of the inlet of said first intake passage; and

second actuating means operated in response to a control signal of said electronic control means and initially opening said shut-off valve at a first speed and then opening it at a second speed which is lower than said first speed when the level of the load of the engine becomes higher than the predetermined level.

4,466,405

FEEDBACK TYPE IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

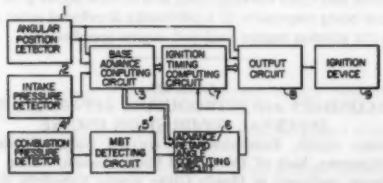
Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Anjo; Yoshinori Ootsuka, Okazaki; Kenji Goto, and Daisaku Sawada, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 097,663, Nov. 27, 1979, Pat. No. 4,328,779. This application May 6, 1982, Ser. No. 375,668

Claims priority, application Japan, Dec. 7, 1978, 53-152334

Int. Cl.³ F02P *5/12*

U.S. Cl. 123—416 **8 Claims**



1. An ignition timing control system of feedback type for a combustion engine comprising:

an angular position detector to generate a plurality of angular pulses for one revolution of the engine;

an intake pressure detector to detect an intake pressure of the engine;

a base advance computing circuit including ROM means having ignition timing data preliminarily programmed therein responsive to said angular position detector and said intake pressure detector to determine a base advance angle of ignition timing;

a combustion pressure detector to detect a cylinder combustion pressure of the engine;

an MBT detecting circuit responsive to said combustion pressure detector to detect whether the ignition timing is advanced or retarded with respect to the minimum advance for best torque of the engine and provide a corresponding detection signal;

an advance/retard angle computing circuit including RAM means having ignition timing correction data programmed therein responsive to said base advance computing circuit and said MBT detecting circuit to determine an advance/retard angle, the correction data of said RAM means being updated depending on the detection signal of said MBT detecting circuit and stored at a storage area of said RAM means corresponding respectively to the intake pressure and the revolution of the engine;

an ignition timing computing circuit responsive to said base advance computing circuit and said advance/retard angle computing circuit to compute an advance angle from the base advance angle and the advance/retard angle; and

an output circuit responsive to said angular position detector and said ignition timing computing circuit to provide an ignition signal to an ignition device of the engine.

4,466,406

REGULATING DEVICE FOR CONTROL VARIABLES OF AN INTERNAL COMBUSTION ENGINE

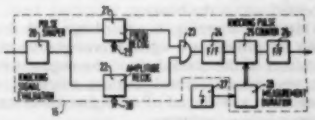
Erwin Hartung, Stockstadt; Martin Klenk, Kirchberg, and Heinz Möller, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,193

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026097

Int. Cl.³ F02D *5/00, 37/02*

U.S. Cl. 123—425 **10 Claims**



1. A regulating device for control variables of an internal combustion engine comprising

an ignition system having a control means for producing a signal output,

at least one knocking sensor in the engine producing knocking signal output,

a knocking-signal evaluation circuit responsive to the signal output of the ignition system and responsive to the knocking signal output of the at least one knocking sensor and producing a fuel metering signal,

a digital frequency recognition circuit in the knocking-signal evaluation circuit for filtering out from the knocking signal output a knocking frequency signal and producing a corresponding output,

an amplitude recognition circuit in the knocking-signal evaluation circuit for determining amplitude of the knocking signal output and producing a corresponding output,

a measurement-time control circuit in the knocking-signal evaluation circuit for producing a duration signal output only during specific times relative to the signal output of the ignition system, and

means responsive to said duration signal output for acting on the outputs of said frequency recognition circuit and said amplitude recognition.

4,466,407

IGNITION PULSE AND CRANKSHAFT ANGLE PULSE GENERATOR AND DISTRIBUTOR COMBINATION

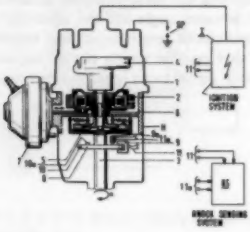
Reinhard Aures, Eggenstein; Jörg Bonitz, Mühlacker; Robert Entenmann, Benningen; Rochus Knab, Kornwestheim; Siegfried Rohde, Schwieberdingen, and Herbert Schramm, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,590

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137181

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—425 **8 Claims**



1. An ignition pulse and crankshaft pulse generator and distributor combination having

a housing (H);

a distributor shaft (3) coupled to rotate with the crankshaft of the engine;

a sleeve (6) surrounding the shaft, rotating therewith, and further rotatable with respect thereto;

a centrifugal controller (5) coupled to the shaft and to the sleeve for adjusting ignition timing as a function of engine speed by changing the relative angular position of the sleeve and of the shaft;

and means for providing ignition pulses having a rotating part (1) coupled to the sleeve (6), and a stationary part (2) located within the housing,

and further comprising, in accordance with the invention,

means for providing a signal representative of the angular position of the crankshaft of the engine with respect to reference positions, said positions indicating respectively a beginning and an end of an engine knocking recognition time window, including

means for providing angle-representative pulses having

a second rotating part (8) coupled to positively rotate with the shaft (3),

a second stationary part (9) secured in the housing;

and electrical output connection means (11) connected to the stationary part.

4,466,408

APPARATUS FOR CLOSED-LOOP COMBUSTION CONTROL IN INTERNAL COMBUSTION ENGINES

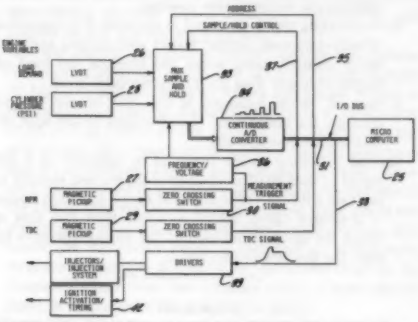
George E. Cheklich, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 10, 1983, Ser. No. 474,087

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **4 Claims**

1. Engine ignition control mechanism for an engine equipped with fuel injectors, said mechanism comprising computer means having a multiplicity of cylinder pressure-crank angle curves stored therein representing desired engine performance, each curve being for a different engine speed-load combination, whereby the multiplicity of curves establishes a desired engine operating map; each stored curve comprising digital signal means identifying desired rate of pressure change from a time prior to the fuel injector crank-open point to a time after the peak cylinder pressure point; means (26) sensing actual load demand, means (27) sensing actual engine speed, and means (28) sensing actual cylinder pressure; said computer means including a multiplexer, analog-digital converter and microcomputer; said multiplexer having an address line (35) and a sample-hold line (37); said multiplexer having separate input lines connected to said load demand sensing means (26) said speed sensing means (27), and said pressure sensing means (28); said multiplexer having an output line connected to the analog-digital converter for delivering thereto load demand signals, speed signals, and cylinder pressure signals; said computer means including in-out bus means (31) interconnecting the analog-digital converter and microcomputer; said stored pressure crank angle curves comprising digital signal means located in the microcomputer; said in-out bus means being



operative to convey digitized actual load demand signals, actual speed signals and actual pressure signals to the microcomputer; means in the microcomputer responsive to digitized speed-load demand signals for selecting an associated stored curve from the aforementioned multiplicity of curves; means in the microcomputer for comparing the digitized actual pressure signal with the selected stored signal to develop an error signal representing deviation of actual engine performance from desired engine performance; the microcomputer including means for generating a control signal (38) effective to adjust the injector crack-open point, injection pressure and injector stay-open duration time, said control signal generating means being responsive to a previously developed error signal and the existing engine load and engine speed signals.

4,466,409

SECONDARY AIR INTRODUCING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Urataro Asaka, Kamifukuoka; Teruyuki Nakano; Shinkichi Miyazawa, both of Tokyo, and Shoji Masuda, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,270

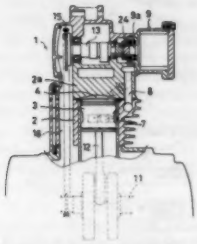
Claims priority, application Japan, Jul. 11, 1981, 56-107595; Oct. 28, 1981, 56-171317; Nov. 5, 1981, 56-176382; Nov. 5, 1981, 56-176383

Int. Cl.³ F02B *15/00*

U.S. Cl. 123—433 **8 Claims**

1. A secondary air introducing apparatus for an internal combustion engine, the engine including a cylinder having a side wall, a piston slideably mounted in the cylinder moveable between a top dead point and a lower dead point, and a cylinder head mount atop of the cylinder, said apparatus comprising a secondary air introducing opening in said side wall of said cylinder near the position of the lower dead point of said piston, said opening being opened and closed by said piston, a secondary air supply source, and an introducing passage interconnecting said supply source to said opening, said introducing passage being formed to be an upwardly directed passage

extending only upwards from said opening, a passage section adjacent said opening being free of both horizontal portions



and portions extending below said opening, the entire introducing passage being formed integrally in the side walls of the cylinder head and cylinder block.

4,466,410

AIR-FUEL RATIO CONTROL FOR INTERNAL COMBUSTION ENGINE

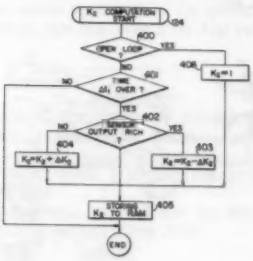
Shuji Sakakibara; Toshio Kondo; Akio Kobayashi, and Shigenori Isomura, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 14, 1982, Ser. No. 398,275

Claims priority, application Japan, Jul. 15, 1981, 56-110385; Jul. 20, 1981, 56-113268; May 24, 1982, 57-88289

Int. Cl.³ F02B *3/00*; F02M *7/00*

U.S. Cl. 123—440 **13 Claims**



1. A method of engine air-fuel ratio control comprising the steps of:

producing integration data by integrating the output signal of an air-fuel ratio sensor;

comparing a reference value of integration data with the integration data obtained by the previous integration step, when under predetermined stable operating conditions;

increasing the fuel injection amount compensation data by a predetermined amount when said produced integration data is on a lean side;

reducing said fuel injection amount compensation data by a predetermined amount when said produced integration data is on a rich side;

storing said fuel injection amount compensation data in a memory in accordance with the engine conditions;

computing the basic fuel injection amount from the engine speed and the intake air amount;

reading a fuel injection amount compensation data from said memory in accordance with the engine conditions; and

correcting said basic fuel injection amount by said produced integration data and said fuel injection amount compensation data read out, thereby controlling the air-fuel ratio of the engine, but delaying the correcting step for a predetermined period of time after the engine operating condition changes from an unstable condition to a stable condition.

4,466,411

AIR/FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

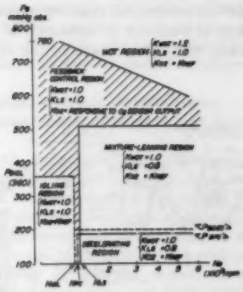
Shumpei Hasegawa, Niiza, and Toyohei Nakajima, Shiki, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,081

Claims priority, application Japan, Jun. 9, 1982, 57-98944

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—480 **10 Claims**



1. A method for controlling the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine for a vehicle, said engine having a power transmission means for transmitting the torque of the engine to wheels of the vehicle, to required values in response to the output of means for detecting the concentration of an ingredient in exhaust gases emitted from the engine, the method comprising the steps of: (1) determining whether the engine is operating in a predetermined feedback control region or in any one of a plurality of predetermined particular operating regions other than said feedback control region; (2) controlling the air/fuel ratio of the air/fuel mixture by the use of a first coefficient which has a value variable in response to the output of ingredient concentration detecting means, and at the same time, determining a mean value of values of said first coefficient as a second coefficient, while the engine is operating in said predetermined feedback control region; (3) monitoring a period of time elapsing from a time it is determined that a transition occurs in the operation of the engine from said predetermined feedback control region to one of said predetermined particular operating regions; (4) holding the value of said first coefficient at a value thereof obtained immediately before said transition, and controlling the air/fuel ratio of the air/fuel mixture by the use of said held value of said first coefficient, until said period of time monitored at said step (3) exceeds a predetermined period of time; and (5) controlling the air/fuel ratio of the air/fuel mixture by the use of said second coefficient in place of said first coefficient after said period of time monitored at said step (3) has exceeded said predetermined period of time.

4,466,412

PRIMING AND ACCELERATION FUEL ENRICHMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Richard M. McChesney, Waukegan, and Chester G. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

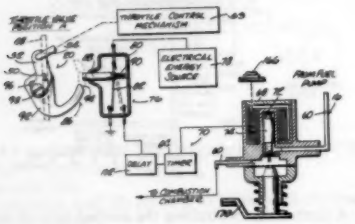
Continuation-in-part of Ser. No. 92,575, Nov. 8, 1979, Pat. No. 4,312,314. This application Jan. 11, 1982, Ser. No. 338,335

Int. Cl.³ F02M *1/16*

U.S. Cl. 123—492 **7 Claims**

1. An engine operable between a low speed and a range of

speeds above the low speed, said engine comprising a combustion chamber, throttle means operatively connected with said engine for movement between a low speed position for operating said engine at the low speed and a range of positions spaced from said low speed position for operating said engine within the range of speeds above the low speed, a fuel pump adapted to communicate with a fuel source, a first fuel delivery means communicating with said fuel pump and with said combustion chamber for supplying fuel to said combustion chamber subject to control by said throttle means, and a second fuel delivery means communicating with a fuel source and with said combustion chamber independently of said first fuel delivery means, said second fuel delivery means including a squeeze bulb adapted to communicate with the fuel source, valve means operable between open and closed positions to control fuel flow to said combustion chamber in response to operation of said pump in response to squeezing of said squeeze bulb, means biasing said valve means to the closed position, and



means for controlling operation of said valve means including manually operable means connected to said valve means for opening said valve means, and electrical circuit means connected to said valve means and to said throttle means for operating said valve means in response to advancement of said throttle means from said low speed position to locate said valve means in the open position so as to introduce fuel from said fuel pump into said combustion chamber for a predetermined time interval, said electrical circuit means including first delay means for preventing a second opening of said valve means in response to a second advancement of said throttle means from said low speed position until after expiration of said predetermined time interval and further including second delay means for preventing a second opening of said valve means in response to a second advancement of said throttle means from said low speed position until after said throttle means has been retained in said low speed position for a predetermined time period, regardless of the expiration of said predetermined time interval.

4,466,413

FUEL CUT SYSTEM FOR ELECTRONIC CONTROL SYSTEM

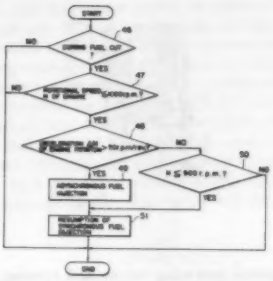
Akito Oonishi, Toyota, and Haruo Watanabe, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 24, 1982, Ser. No. 391,715

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—493 **4 Claims**

1. A fuel cut system for an electronic control engine, comprising an electronic control unit for selectively supplying fuel to the engine, said control unit completing the fuel cut when deceleration of the engine rotation during the fuel cut is less than a predetermined value with the rotational speed of the engine being reduced to a first predetermined value, the fuel cut being completed and asynchronous fuel injection being carried out immediately after the fuel cut when the deceleration of the engine rotation during the fuel cut is greater than said predetermined value with the rotational speed of the



engine being lowered to a second predetermined value larger than the first predetermined value.

4,466,414

SUPERCHARGED INTERNAL COMBUSTION ENGINE

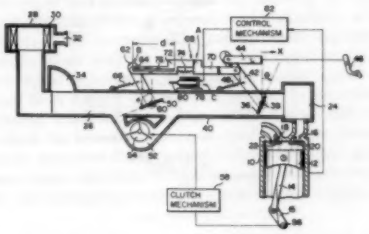
Junjiro Yoshimura, Okazaki; Kenji Yamada, Aichi, and Haruyuki Obata, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 6, 1982, Ser. No. 395,341

Claims priority, application Japan, Jul. 7, 1981, 56-100917[U]; Jul. 7, 1981, 56-100918[U]; Dec. 10, 1981, 56-199414; Dec. 10, 1981, 56-199415

Int. Cl.³ F02D *23/00*

U.S. Cl. 123—564 **13 Claims**



1. An apparatus for supplying air to a cylinder of an engine, comprising:

a first channel, one end of which is open to the atmosphere, the other end of which is connected to the cylinder and in which an air stream flowing toward the cylinder is provided;

a first valve in the first channel adjacent said other end thereof and being movable between a first position where the first valve sets the cross-sectional area of the air stream minimum and a second position where the first valve sets the same maximum, thereby controlling the output power of the engine;

a second valve in the first channel adjacent said one end thereof and being movable between a third position where the second valve closes the first channel and a fourth position where the second valve opens the first channel;

a second channel attached to the first channel to bypass the second valve;

a supercharger provided in the second channel;

a link mechanism connecting the first valve to the second valve, to move the second valve from the fourth position to the third position when the first valve moves from the first position to the second position, and to move the

second valve from the third position to the fourth position when the first valve moves from the second position to the first position; and

play means attached to the link mechanism, for allowing one of the first and second valves to move when the other valve is held at a fixed position,

wherein the second valve is rotatably mounted and, when the second valve is in the fourth position, an angular interval between the fourth position and the third position is set greater by a predetermined angle than an angular interval between the third position and a position where the first channel is opened to a maximum, whereby initial movement of the second valve to close the first channel is delayed from the initial movement of the first valve from the first position,

wherein the play means has a first play mechanism for allowing movement of the second valve from the third position to the fourth position, while the position of the first valve is retained, and

wherein the link mechanism includes:

a movable first lever fixed to the first valve, for defining a position of the first valve; and

a movable second lever connected to the second valve, for defining a position of the second valve in response to the movement thereof, and

the first play mechanism includes:

a first arm connected to the first lever;

a second arm connected to the second lever to be contactible with the first arm; and

urging means for urging the first and second arms to contact each other;

whereby the first valve is rotated from the first position to the second position since the first arm is separated from the second arm, even if the second valve is fixed in position, and the second valve is rotated from the third position to the fourth position since the second arm is separated from the first arm, even if the first valve is fixed in position.

4,466,415

EGR CONTROL SYSTEMS FOR DIESEL ENGINES

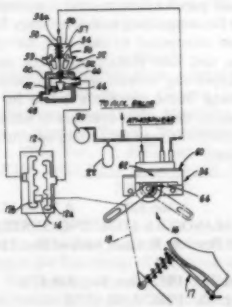
Gunter Piesche, Ubstadt-Weiher, Fed. Rep. of Germany, assignor to Ranco Incorporated, Dublin, Ohio

PCT No. PCT/US82/00407, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983

PCT Filed Mar. 31, 1983, Ser. No. 535,638

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **6 Claims**



1. In an automotive vehicle having a diesel engine, a throttle system actuable to control the engine speed, a vacuum pump driven by the engine and forming, at least in part, a vacuum pressure source, and an EGR system having an EGR valve assembly operable to recirculate exhaust gas to the engine air intake in relation to the degree of valve operating vacuum pressure communicated thereto and, a valve controller for governing the level of vacuum pressure communicated to the EGR valve from the vacuum pressure source, said valve controller comprising:

(a) a housing defining an output port communicating with the EGR valve for supplying operating pressure thereto, an input port communicating with the vacuum pressure source, and an input port communicating with ambient atmospheric pressure;

(b) a regulator valving means in said housing including a control member movable to control communication between said output port and said input ports to govern the valve operating vacuum pressure level, said control member acted upon by differential pressure force between the output pressure and the pressure at one of said input ports; and,

(c) throttle position responsive means for exerting actuating force on said control member which varies as a predetermined function of throttle system operation to alter the output pressure, said throttle position responsive means comprising:

(i) a lever connected to said throttle system;

(ii) a cam supported by said housing and driven by said lever; and,

(iii) a resiliently deflectable force transmitting element between said cam and said control member for applying force to said control member depending on the position of said lever, said force transmitting element effective to change the force applied to said control member in response to change in the cam position with said control member moving in response thereto to establish a changed output pressure to said EGR valve at which the forces acting on said control member are balanced.

4,466,416

EXHAUST GAS RECIRCULATION CONTROL METHOD AND APPARATUS FOR A DIESEL ENGINE

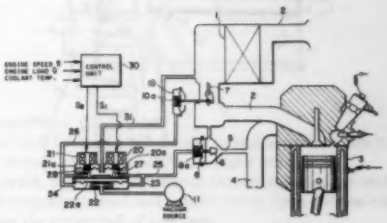
Yoshihisa Kawamura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Aug. 3, 1982, Ser. No. 404,912

Claims priority, application Japan, Aug. 4, 1981, 56-122028

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 **8 Claims**



1. A method for controlling exhaust emissions from an internal combustion engine equipped with a throttled air intake passage and an exhaust passage linked to the intake passage via an exhaust gas recirculation (EGR) valve, comprising the steps of:

(a) measuring engine operating conditions;

(b) determining a desired degree of EGR valve opening on the basis of the measured engine operating conditions;

(c) opening the EGR valve to the desired degree;

(d) determining a desired degree of throttle valve opening on the basis of engine operating conditions;

(e) detecting whether the EGR valve is completely open;

(f) opening the throttle valve to the desired degree in response to detection of a completely open EGR valve; and

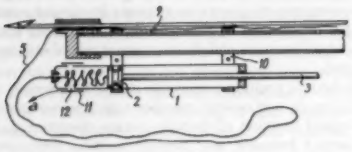
(g) completely opening the throttle valve in response to detection of a partially open EGR valve.

4,466,417

MAGAZINE FOR UNDERWATER CROSSBOW STRING FUNCTIONING BY DEPRESSION

Georges Mulot, and Suzette Mulot nee Crubilhe, both of 152, rue Paul Doumer, 78.420 Carrieres S/Seine, France

Filed Jan. 26, 1982, Ser. No. 342,758
Claims priority, application France, Jan. 27, 1981, 81 01429
Int. Cl.[3] F41B 5/00
U.S. Cl. 124—25 11 Claims



1. A crossbow apparatus capable of use while submerged under water comprising:

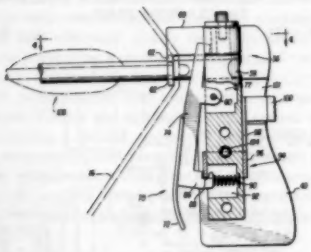
a projectile operatively attached to said apparatus, a string attached at one end to said projectile, means for retracting said string, said means for retracting being attached to the other end of said string, a magazine in which said string normally reposes until the projectile is fired, and means to actuate said retracting means after the projectile is fired thus causing low pressure to develop in said magazine with subsequent withdrawing of said string due to water being withdrawn into said magazine.

4,466,418

BOWSTRING TRIGGER RELEASE MECHANISM

Bobby L. Jones, 432 Adams St., Elyria, Ohio 44035

Filed Jul. 26, 1982, Ser. No. 401,561
Int. Cl.[3] F41B 5/00
U.S. Cl. 124—35 A 9 Claims



1. A combined trigger and safety release mechanism for an archery bow for shooting arrows which comprises

a. a handle member,

b. a cylindrical actuator spool received within said handle member,

(1) said cylindrical actuator spool having a shaft-like extension on its upper end,

c. a rotatable arrow release member mounted on said shaft-like extension,

d. a trigger mechanism pivotally mounted on said cylindrical actuator spool,

(1) said trigger mechanism having a pivotal lever with first latch means engageable with said rotatable release mechanism and second latch means for locking said trigger mechanism in place,

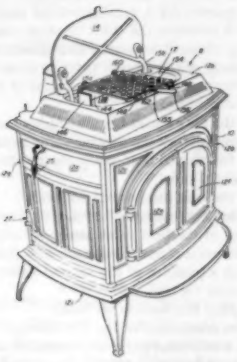
e. and a safety release mechanism engageable with said second latch means to lock said trigger mechanism.

4,466,419

COOKING METHOD AND APPARATUS FOR USE WITH WOOD-BURNING STOVE

Duncan C. Syme, Chelsea, Vt., assignor to Vermont Castings, Inc., Randolph, Vt.

Filed Dec. 8, 1980, Ser. No. 213,952
Int. Cl.[3] F24C 1/14
U.S. Cl. 126—4 26 Claims



1. A solid fuel burning heating and cooking apparatus comprising:

a fuel-containing frame member enclosing a combustion chamber,

said frame member having an apertured panel for defining a panel aperture in said frame member, and means for covering said aperture,

said frame member further having means for defining a combustion products exit aperture, said exit aperture and said panel aperture having a positioned interrelationship with a ratio of the cross-sectional area of said panel aperture to the cross-sectional area of said combustion products exit aperture being sufficient to draw air by naturla draft through said panel aperture into said frame member while solid fuel is burning in said combustion chamber and said panel aperture is uncovered, and

coverless apertured grill means for cooking food substantially unimpeded over a secondary fuel source, and means for supporting said grill means and said secondary fuel source in said frame member in the path of said natural draft through said panel aperture, said supporting means including a base for supporting said secondary fuel source and side portions connected to said base for supporting said grill means, said side portions defining an aperture through said supporting means, said apparatus utilizing said fuel-containing frame member's means for naturally drawing air through said panel aperture in order to draw cooking by-products through said panel aperture and into said frame member.

4,466,420

MODULAR MASONRY HEATING SYSTEM

Hugh W. Ernisse, and Perri A. Ernisse, both of Box 2146, Littleton, Mass. 01460

Filed Feb. 12, 1982, Ser. No. 348,471
Int. Cl.[3] F24C 1/16, 1/00
U.S. Cl. 126—120 25 Claims

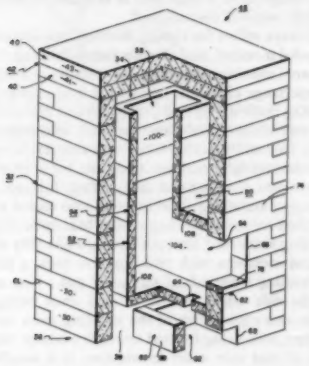
1. A modular masonry heating system for providing heat to a space comprising:

a plurality of heat shell modules each having a substantially uniform size and shape precast from refractory material and having means for engaging an adjoining heat shell module so as to form a self-supporting heat shell without said adjoining heat shell modules being secured together

by a bonding material, said heat shell comprising an enclosing wall supported on a supporting surface and a cover supported on said enclosing wall to form a flue chamber;

a firebox supported within said flue chamber independently of said heat shell and in spaced relation to at least a portion of said heat shell, said firebox including an enclosure forming a fire chamber for burning a combustible fuel, foundation means for supporting said fire chamber enclosure on said supporting surface and riser means for conveying products of combustion from said fire chamber to said flue chamber so as to heat an exterior surface of said heat shell, said firebox and said heat shell each being freestanding independently of the other;

means for introducing a combustible fuel and combustion air into said fire chamber; and,



means for exhausting said combustion products from said flue chamber;

each of said wall modules having an elongated body of substantially rectangular cross-section and joint means at each end of said elongated body for forming a joint with another of said wall modules when two of said wall modules are in abutting relation such that said joint has substantially the same rectangular cross-section as said elongated body, and said joint means comprising a tongue projecting from each end of said elongated body and arranged to rest on a corresponding tongue of another of said wall modules when two of said wall modules are in either longitudinal or perpendicular end-to-end abutment with one module inverted relative to the other.

4,466,421

AFTERBURNER FOR A WOOD STOVE

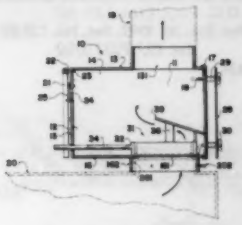
Eddy H. Dorsch, Woodlands, Canada, and Herbert Dorsch, General Delivery, Woodlands, Manitoba, Canada (R0C 3H0), assignors to Herbert Dorsch, Woodlands, Canada

Filed Nov. 22, 1983, Ser. No. 554,233

Int. Cl.³ F23L *3/00;* **F23J** *15/00;* **A01D** *75/06;* **F23Q** *11/00;* **F01C** *1/00*

U.S. Cl. 126—285 A **14 Claims**

1. An afterburner for a wood stove comprising a housing, connection means at the bottom of the housing for connecting the housing to the flue outlet of the wood stove and defining an inlet into the housing for flue gases from the wood stove, connection means at the top of the housing for connecting the housing to a flue and defining an outlet from the housing for flue gases escaping to the flue, the outlet and the inlet being arranged adjacent the rear of the housing and in substantially overlying relationship, the housing having a forward section projecting forward in front of the inlet, a support member for a catalytic combuster, a manually operable handle extending from the exterior of the housing to the support for moving the support from a position in which the combuster overlies the inlet so that flue gases pass therethrough to a position in which the combuster lies in the forward section and is spaced from the inlet so as to allow the flue gases to pass from the inlet to the outlet without passing through the combuster, and baffle



means mounted on the support means and movable therewith and arranged such that the first position the baffle means diverts flue gases from the inlet into the forward section and in the second position the flue gases pass from the inlet to the outlet without engaging the baffle means.

4,466,422

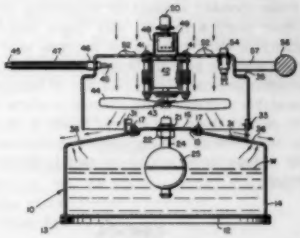
HUMIDIFIER AND AIR CIRCULATOR

Samir C. Lahiri, 244 Old New Rd., Chalfont, Pa. 18946

Filed Mar. 3, 1983, Ser. No. 471,889

Int. Cl.³ F24H *1/00*

U.S. Cl. 126—350 B **14 Claims**



1. A humidifier, comprising

a water tank having a substantially closed upper end which has therein a plurality of spaced vapor ports,

an inverted, generally cup-shaped shroud mounted on said tank centrally thereof, and with its lower, open end spaced above the upper end of said tank,

an electric fan mounted to rotate in said shroud coaxially thereof, and in spaced, confronting relation to said upper end of said tank, and

means for connecting said fan to an electrical power supply for operation thereby,

said shroud having in its upper end a plurality of vent openings, whereby upon energization of the fan air is drawn by the fan inwardly through said vent openings, and is discharged radially outwardly through the lower end of said shroud and across said vapor ports to entrain moisture therefrom,

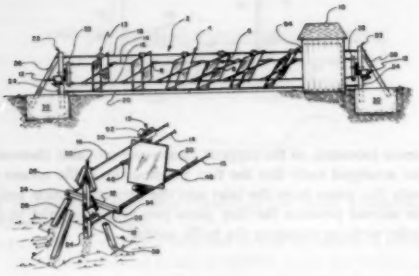
said tank having an outside diameter larger than that of said shroud, and

said vapor ports being positioned so that at least portions thereof extend radially outwardly beyond and relative to said lower end of the shroud.

4,466,423
RIM-DRIVE CABLE-ALIGNED HELIOSTAT COLLECTOR SYSTEM

James E. Dolan, Denver, Colo., and Timothy D. Sands, Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 429,923
Int. Cl.³ F23J 3/02
U.S. Cl. 126—424 30 Claims

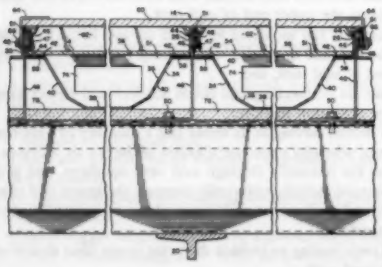


1. A heliostat collector apparatus comprising:
(a) at least one heliostat suspended from a plurality of longitudinally extending linkage means;
(b) an enclosure structure disposed adjacent said at least one heliostat, said enclosure structure providing a means for allowing said heliostat to be substantially protected from weathering;
(c) a first drive means operatively connected to said at least one heliostat to effect steering of said heliostat in a first of the two predetermined directions; and
(d) a frame member adapted for supporting said heliostat at an inner portion thereof, said frame member having a plurality of outer expandable portions with each one of said expandable portions being slidably engageable with a corresponding one of said plurality of linkage means, said expandable portions being adapted to allow said heliostat to be moved along said linkage means in directions away from and towards said enclosure structure and to substantially reduce stress acting on said heliostat during said steering.

4,466,424
SOLAR COLLECTOR SYSTEM FOR STANDING SEAM ROOFS

C. W. Lockwood, Jr., P.O. Box 549, Hampton, Va. 23669

Filed Dec. 11, 1981, Ser. No. 329,655
Int. Cl.³ F24J 3/02
U.S. Cl. 126—452 30 Claims



1. A solar collector system incorporated into a standing seam roof comprising:
at least one solar collector unit, and guiding means for guiding an energy absorbing fluid to and from said at least one collector unit,
said collector unit including a transparent upper sheet member for allowing solar energy to enter said collector unit, and at least one panel section of a standing seam roof,
said panel section comprising a trough-shaped panel member having a center portion, two opposite ends and longitudinal sides walls extending upward from said center portion, a first of said opposite ends being located toward an outer perimeter of the standing seam roof and a second of said opposite ends being located towards a center ridge thereof, said side walls terminating in a standing seam element extending upward from said center portion for interlocking fit with another upwardly extending standing seam element of an adjacent panel member, said sheet member longitudinally resting upon and supported by upper portions of at least two of said side walls and being sealingly secured thereto; and
lateral closure means for closing said first and second ends of said panel member, said closure means forming a seal with said panel member and said sheet member to form a sealed heat exchange chamber, said sealed heat exchange chamber being enclosed by said center portion and said longitudinal side walls of said panel member, said lateral closure means, and said sheet member, said heat exchange chamber including inlet and outlet means for communication between said chamber and said guiding means for passing the energy absorbing fluid through said sealed chamber.

3. A method for incorporating a solar heat collection system into a standing seam roof, the roof having a plurality of trough-shaped panel members with two opposite ends, a pair of upwardly extending longitudinal side walls and a base extending between the side walls, a first of said ends being located towards the outer perimeter of the standing seam roof, and a second of said ends being located towards a center ridge of the roof, each of said side walls terminating in a standing seam element extending upward from said base for interlocking fit with another upwardly extending standing seam element of an adjacent panel member, the plurality of members resting on a roof support, comprising the steps of:
(a) placing lateral closures at the first and second ends of at least one of the panel members of the standing seam roof to form a lateral wall member at either of said ends;
(b) placing a transparent sheet member on at least one of said panel members of the standing seam roof so that said sheet member extends between the longitudinal side walls and lateral closures of at least one of said panel members to form a chamber therebetween;
(c) securing said sheet member to said panel member;
(d) sealing said sheet member to said longitudinal walls of said panel member and said lateral closures to seal said chamber, whereby said chamber forms a heat exchange chamber;
(e) forming an inlet to said heat exchange chamber for the entry of an energy absorbing fluid;
(f) forming an outlet from said heat exchange chamber for the exit of the energy absorbing fluid;
(g) installing a guide means for guiding the energy absorbing fluid to and from said heat exchange chamber and through the solar collection system.

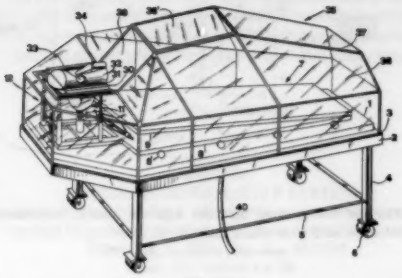
4,466,425
OPERATING TABLE FOR OPHTHALMIC SURGERY

Carlo Maggi, 8 Via Latina, 00179 Roma, Italy

Filed Jan. 8, 1982, Ser. No. 338,147
Claims priority, application Italy, Jan. 20, 1981, 47599 A/81
Int. Cl.³ A61B 19/00
U.S. Cl. 128—1 R 8 Claims

1. An operating table for ophthalmic surgery, comprising a base member for supporting the patient to be operated on; a cover member, airtight mounted with respect to said base member and adapted to enclose the entire body of said patient; aperture means disposed in said cover member and adapted to

encircle the eye to be operated on, the edge of said aperture means being further adapted to be sealed around the orbital edge of the eye of the patient such that the patient's entire body, excluding the orbital region may be subjected to a differ-



ence in pressure with respect to the atmospheric pressure, said difference in pressure acting on the exposed orbital area so as to exert a compression in the vascular system of the eye, when surgically opened, equal to that which the intraocular pressure exerted prior to the eye being opened.

4,466,426

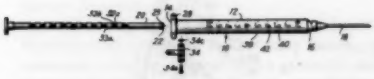
SYRINGE WITH ACTINIC RAY BLOCKING STRIPE

Seymour N. Blackman, c/o Premo Pharmaceutical Laboratories, Inc., 111 Leuning St., South Hackensack, N.J. 07606

Continuation of Ser. No. 278,593, Jun. 29, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 485,956

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—1.1 **21 Claims**



1. A hypodermic syringe comprising:

(a) a transparent barrel adapted to contain a liquid medication adversely affected by actinic rays, the barrel having two open ends, one of said two ends capable of having a hypodermic needle attached thereto;

(b) a plunger slidably insertable into the other open end of the barrel, said plunger having a bottom end with a reading means proximate thereto, and a top manipulative handle projecting beyond said one end of said barrel;

(c) visual indicia means on the barrel;

(d) non-removable, rectilinear means integral with the barrel for blocking actinic rays, said means extending generally the full length of the indicia marked portion of the barrel and between 150° and 270° circumferentially of the barrel, whereby the medication in the syringe is permanently protected from the destructive effects of actinic rays as long as said rectilinear means is uppermost, and

(c) means for constantly orienting the means for blocking actinic rays upwardly from a surface upon which the syringe rests.

4,466,427

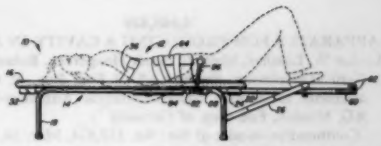
TRACTION DEVICE

Elof Granberg, San Rafael, Calif., assignor to Granberg Pump & Meter Ltd., Richmond, Calif.

Continuation-in-part of Ser. No. 182,551, Aug. 29, 1980,. This application Oct. 2, 1981, Ser. No. 308,005

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—71 **5 Claims**



1. A traction device comprising:

a portable frame having an upper surface adapted to support an individual to be subjected to traction, and a pair of rods releasably engageable with the frame proximate the opposite ends of the upper surface and providing mounting points spaced from said upper surface;

a pair of tension members emanating from the frame and having free ends passing through the respective mounting points and back toward the upper surface of the frame;

a pelvic strap assembly attachable to the free end of one of the tension members and secured to the individual to provide pelvic traction, and a cervical halter attachable to the free end of the other tension member and secured to the individual to provide cervical traction;

a hydraulic cylinder mounted on the frame and capable of being secured to the tension members so that traction is applied to the individual when the cylinder is actuated;

a manually-operated pump mounted to the frame and fluidly connected to hydraulically actuate the cylinder;

means for adjustably limiting the maximum force applied to the cylinder by the pump while maintaining that maximum force until released; and

means for releasing the force applied by the pump to the cylinder.

4,466,428

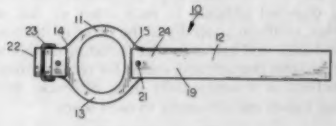
PATELLA SUPPORT APPARATUS

Dalton R. McCoy, No. 14 Birchwood Pl., Kearney, Buffalo County, Nebr. 68847

Filed Jul. 16, 1982, Ser. No. 398,738

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 C **1 Claim**



1. A patella support apparatus comprising:

(a) a brace means substantially rigidly encircling the patella, for applying pressure substantially completely around and to the patella, said brace means including a substantially annular support member concavely shaped to facilitate the positioning of the said brace means about the patella, said support member having a pair of spaced apart projections operably integrally disposed thereon, said projections being thicker on the outside portion thereof than on the inside portion thereof whereby said projections will apply pressure to the outer and inner portions of the patella and pad means integrally disposed on said support member continuously between the top and bottom of said

projections for applying pressure to the top and bottom of the patella; and

(b) a popliteal member comprising a strap and being affixable to said brace member to secure said brace means in position about the patella such that said brace means substantially prevents lateral and medial movement of the patella while walking, running or jumping without substantially impairing the user's ability to walk, run or jump.

4,466,429

APPARATUS FOR PRODUCING A CAVITY IN A BONE

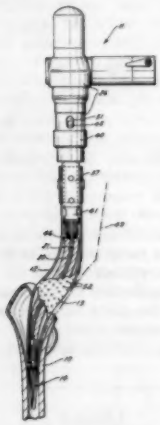
Lothar W. Loscher, Munich; Frank Hoogeveen, Rohrmoos, and Gerd Hanselmann, Dachau, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 133,374, Mar. 24, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,470

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914455

Int. Cl.³ A61F *5/04, 17/32*

U.S. Cl. 128—92 E **12 Claims**



1. Apparatus for producing a cavity in a bone to accommodate an artificial joint member, comprising two longitudinally extending rasping halves each said half having, in cross-section, a relatively broad outer surface portion extending between two inwardly directed, relatively narrow, edge portions, the corresponding edge portions of said rasping halves being disposed adjacent to each other so that said halves, together, conform generally to the shape of the bone cavity to be produced, said halves further including cutting teeth on the outer surfaces thereof; and, means for reciprocating both rasping halves, in a substantially axial direction, such that the rasping halves move counter to each other.

4,466,430

SURGICAL DRAPE WITH INSTRUMENT SUPPORT

Jay S. Shultz, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 23, 1982, Ser. No. 391,369

Int. Cl.³ A61F *13/00*

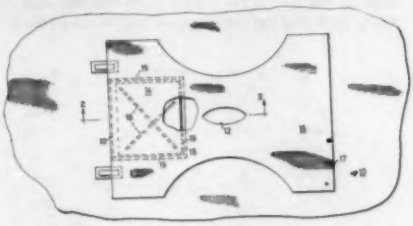
U.S. Cl. 128—132 D **4 Claims**

1. A surgical drape sheet comprising:

a flexible fibrous base sheet having a primary operative area including a fenestration area;

a flexible liquid impervious fabric covering said primary operative area and attaching to said base sheet;

a flat, rigid inflexible member between said base sheet and said liquid repellent fabric and providing an instrument support section built into said drape sheet spaced from said fenestration; and



means for fixing said member against lateral movement between said base sheet and fabric.

4,466,431

DRESSINGS, MANUFACTURE AND USE

John Tharrat, and Sally-Jane Harlock, both of Hull, England, assignors to Smith and Nephew Associated Companies Limited, England

Filed May 7, 1982, Ser. No. 376,161

Claims priority, application United Kingdom, May 9, 1981, 8114239; Jun. 24, 1981, 8119490; Sep. 8, 1981, 8127164

Int. Cl.³ A61L *15/00*

U.S. Cl. 128—156 **15 Claims**

1. A sterile dressing which comprises a hydrophobic or non-water containing hydrophilic ointment impregnated openwork support having a protector on both faces thereof, said protectors being films soluble in water.

4,466,432

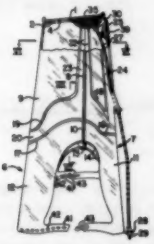
AIR SUPPLYING HOOD

Layton A. Wise, Washington, Pa., assignor to Mine Safety Appliances Co., Pittsburgh, Pa.

Filed Sep. 16, 1981, Ser. No. 302,736

Int. Cl.³ A62B *17/04*

U.S. Cl. 128—201.23 **4 Claims**



1. An air supplying hood comprising a top wall, a flexible plastic front wall connected at its upper edge with the top wall, the upper portion of the front wall forming a transversely curved front window, a flexible back wall behind the window connected with the top wall and the sides of the window to thereby form with the window an open-bottom enclosure for a person's head, the lower portion of the flexible back wall and the front wall below the window forming areas shaped to fit over a person's shoulders and lie against his chest and back, the walls of said enclosure being provided with a plurality of circumferentially spaced hollow vertical struts closed at their upper ends, a hollow band extending around the hood at the upper end of said areas and in fluid flow communication with the lower ends of the struts, said band and struts being inflatable to stiffen them, inflation means for inflating said band and

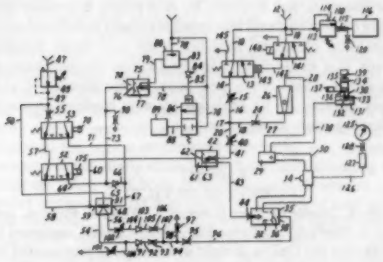
struts, an air tube extending through said back wall for supplying air to said head enclosure, said back wall provided with an opening admitting said tube to the head enclosure, and said inflation means comprising said tube having a lateral opening in fluid communication with the inside of at least one of said struts to inflate the struts and band, said tube further in fluid flow communication with an air muffler provided within the head enclosure downstream of said lateral opening wherein the air muffler discharges air from said tube to the head enclosure.

4,466,433

OVERPRESSURE RELIEF SYSTEM

David L. Robbins, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 4, 1981, Ser. No. 327,552
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—202.22 5 Claims



1. An infant ventilator including a gas delivery system comprising:

an inlet end adapted to be coupled to a continuous source of gas under pressure;

an outlet end;

a mouthpiece between said ends adapted to be coupled to the breathing passageways of an infant;

said system normally being continuously open to allow the flow of gas between said inlet and said outlet end, and further comprising:

outlet valve means movable between a closed position blocking said outlet end for normally causing gas to be contained within said system and a generally uniform gas pressure at the mouthpiece to cause involuntary inspiration of an infant to which the mouthpiece is coupled, and an open position so that gas will flow from said inlet end past the mouthpiece and through said outlet end to the atmosphere while affording exhalation of the infant;

means for switching said outlet valve means between said closed and opened positions in a predetermined time sequence;

means for sensing pressures above a predetermined maximum in said delivery system between said inlet end and said mouthpiece including a portion movable from a first position to a second positon in response to said pressure above a predetermined maximum and being manually resettable from said second position to said first position; and

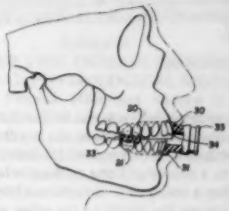
means between said inlet end and said mouthpiece activated in response to movement of said portion to said second position for stopping flow of gas through said delivery system, and for exhausting a portion of said gas delivery system including said mouthpiece to the atmosphere until said portion is manually reset to said first position.

4,466,434

OFFSET MOUTHPIECE STRUCTURE FOR UNDERWATER BREATHING

Lois H. Brownstein, P.O. Box 302, Burtonsville, Md. 20866

Filed Dec. 30, 1982, Ser. No. 440,269
Int. Cl.[3] A62B *7/00*
U.S. Cl. 128—207.14 1 Claim



1. In a mouthpiece for underwater breathing apparatus of the type held in place by biting down on a resilient tab held between the upper and lower teeth overcoming the problem of fatigue caused by the jaws being held in unnatural positions when biting down, the combination comprising,

a breathing tube having one end axially disposed for insertion into the mouth for breathing,

a U-shaped resilient flange having a bridging portion extending into opposite leg portions,

said breathing tube having one end extending through said bridging portion and adapted for grasping by a user with lips about the breathing tube with the flange between the lips and the teeth of the user, to rest contiguous to the teeth of both the upper and lower jaws,

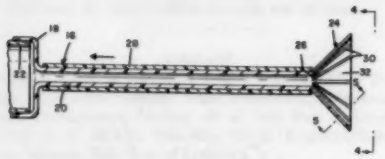
integral retaining means extending inwardly from the leg portions of said flange to reside between the teeth for gripping by biting down thereupon to hold the mouthpiece in place,

and said resilient flange having upper and lower flange members offset along the tube axis to terminate in offset upper and lower wall portions substantially perpendicular to the axis of the breathing tube with said upper wall portion for receiving the upper jaw teeth and said lower wall portion for receiving the lower jaw teeth contiguous thereto only on the outer teeth surfaces, said two walls being offset along the breathing tube axis with the upper wall portion offset an amount from the lower wall portion in a direction away from the leg portions of said flange for receiving the upper and lower jaw teeth respectively contiguous thereto, a flat ledge defined by an intersecting surface in said flange extending between said upper and lower wall portions in a plane substantially parallel to the longitudinal axis of said breathing tube, said retaining means having an upper surface substantially lying in the same plane as said flat ledge whereby the upper teeth will rest on the flat ledge defined by the offset flanges in natural jaw positions, said offset being approximately dimensioned by the normal jaw overbite distance thereby to permit the jaw to rest naturally in place when biting down on the retaining members without need to move the lower jaw into an unnatural position forward from the natural overbite position normal in the human anatomy, thereby to resolve the problem of discomfort and fatigue caused by gripping said retaining means between the teeth with the lower jaw forward from its natural position.

4,466,435
BONE CEMENT NOZZLE AND METHOD

William M. Murray, 145 Bryce Rd., Camp Hill, Pa. 17011

Filed Sep. 4, 1981, Ser. No. 299,410
Int. Cl.³ A61B 17/00
U.S. Cl. 128—303 R 27 Claims

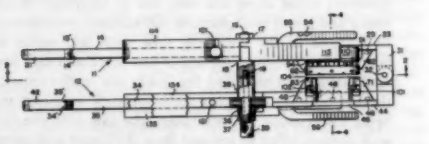


1. A bone cement delivery nozzle for flowing bone cement into a long bone medullary canal, the nozzle including a delivery tube, first means at one end of the delivery tube adapted to be attached to a source of bone cement, wherein the improvement comprises a collapsible imperforate bone cement shield, a connection joining the shield to the other end of the delivery tube such that the shield is movable between a collapsed position for insertion into the canal and an expanded position when in the canal, the other end of the tube opening through the shield, the shield when expanded including a flexible outer circumferential portion engagable with the interior of the canal and an interior pressure surface impervious to bone cement facing the bottom of the canal, and second means for holding the shield in the collapsed position during insertion into the canal and permitting movement of the shield to the expanded position following insertion, whereby bone cement flowed through the tube, past the expanded shield and into the bottom of the canal contacts the interior pressure surface of the shield, biases the outer portion of the shield against the canal and expels the nozzle outwardly of the canal thereby cleaning the canal.

4,466,436
SURGICAL STAPLER

Sukoo Lee, 1516 Long Pond Rd., Rochester, N.Y. 14626

Continuation-in-part of Ser. No. 112,945, Jan. 17, 1980,. This application Dec. 23, 1981, Ser. No. 333,674
Int. Cl.³ A61B 17/12
U.S. Cl. 128—326 11 Claims



1. A surgical stapler for effecting the end-to-end anastomosis of two tubular tissues, comprising

a pair of manually operable clamping devices each having a pair of cooperating jaws movable between open and closed positions,

two pairs of disposable stapling elements, means for removably mounting one pair of said elements on each pair of jaws for movement thereby into operative positions in which the pair of elements on a respective pair of jaws surrounds a tubular tissue adjacent one end thereof, when the associated jaws are closed,

each of said elements having thereon an operating surface,

means on said elements for holding said one end of a respective tissue in an everted position over said operating surface on each of the surrounding pair of stapling elements, when the latter are in their operative positions,

means connecting said devices for movement relative to each other to operative positions in which the everted ends of said tissues are placed in confronting, registering relation,

a plurality of staple drivers movably carried on each of two of said elements to register with arcuate arrays of staple openings formed in the operating surfaces of said two elements, and actuatable, when said devices are in their operative positions to drive staples from said openings and through said everted tissue ends and against the operating surfaces of the other two elements, thereby to staple together the everted tissue ends with a plurality of staples arranged in path around the tissues adjacent said ends thereof,

a pair of arcuate knives movably carried on respectively different ones of said elements to register with diametrally opposite sides, respectively, of said everted tissue ends, when said devices are in their operative positions, and actuable to cut through said everted ends in a closed path radially spaced outwardly from the path in which said staples are arranged, and

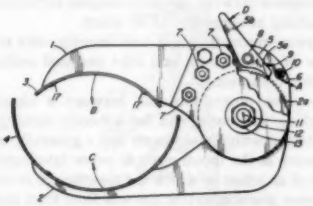
actuating means including a pair of pliers mounted on at least one of said devices and cam means movable radially and axially of said elements, when the latter are in their operative positions, and operable by said pliers, to acutate said staple drivers and said knives substantially simultaneously,

said stapling elements, together with said tissue holding means, said staple drivers and said knives carried thereby, being removable from said jaws independently of said pliers, thereby to be replaced by new stapling elements following each anastomosis.

4,466,437
CLAMPING DEVICE

Walter Dyck, Medicine Hat; Bernard J. Wenner, Ralston, and Walter J. Fenrick, Medicine Hat, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jul. 7, 1982, Ser. No. 396,129
Claims priority, application Canada, Nov. 10, 1981, 390094
Int. Cl.³ A61B 17/12; B25B 7/14
U.S. Cl. 128—327 3 Claims



1. A device to enable the determination of a blood pressure reading with a sphygmomanometer on a patient whose upper arm is not directly accessible, comprising

a pair of jaws;

pivot means to permit relative pivotal movement of said pair of jaws;

releasable locking means associated with said pivot means to lock said pair of jaws in a working position; a plate fastened to each side of one jaw of said pair of jaws, said one jaw and said locking means being between the plates; and

a curved pressure plate carried by each jaw of said pair of jaws, to provide opposed concave surfaces which are sufficiently large to accommodate a folded sphygmomanometer cuff and a patient's upper arm, such that in operation said folded sphygmomanometer cuff is positioned against said upper arm in the area of the brachial artery by said curved pressure plates and the cuff is inflated to

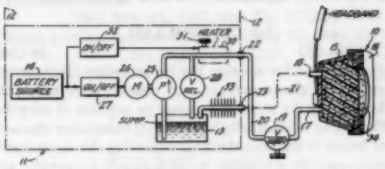
occlude the brachial artery to enable determination of the patient's blood pressure.

4,466,438

METHOD AND MEANS FOR TREATING SYMPTOMS OF MENIERE'S DISEASE OR THE LIKE

Jay W. Katz, 201 Woodbine Ave., Northport, N.Y. 11768

Filed Jul. 20, 1982, Ser. No. 400,155
Int. Cl.³ A61F 7/00
U.S. Cl. 128—400 **17 Claims**



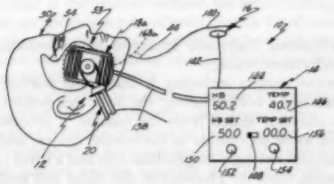
1. Portable caloric liquid-flow therapeutic apparatus for treatment of a nystagmus condition in a patient, comprising a first portable unit including a sump, a pump connected for delivery of liquid from said sump to an outlet connection, a power source and selectively operable control means for operating said pump, and a liquid-return connection to said sump; a second portable unit having means for patient-head support at the region of an ear, said second unit comprising a concave body open at one side and adapted for liquid-retaining conformance to the region of the head around the ear, thereby establishing a substantially closed chamber communicating with the eardrum when said body is thus supported, spaced inlet and outlet connections on said body for fluid flow into and out of said chamber, porous means contained by said chamber and interposed between said open side and said inlet and outlet connections; and flexible conduit means separately connecting said pump-outlet connection with said body-inlet connection and said body-outlet connection with said liquid-return connection.

4,466,439

DEVICE AND METHOD FOR INDUCING BRADYCARDIA

John H. Moore, 5389 Orchard Hill South, Kalamazoo, Mich. 49009

Filed Feb. 8, 1982, Ser. No. 346,497
Int. Cl.³ A61F 7/00
U.S. Cl. 128—402 **22 Claims**



1. A device for inducing dive reflex in a person for medical treatment purposes comprising:

cheek-engaging means;

means for mounting said cheek-engaging means against a portion of at least one of the cheeks of said person, said cheek portion including an area where a portion of the facial nerve surfaces; and

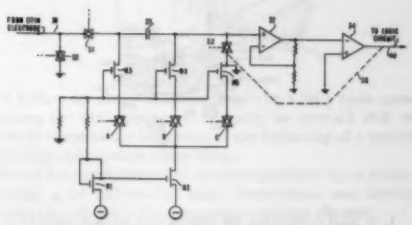
means for controlling the temperature of said cheek-engaging means in a range sufficiently low to induce dive reflex by the application of cold stimulus to said facial nerve, said temperature-controlling means including means for monitoring the pulse-rate of said person, said temperature-controlling means further including means responsive to said pulse-rate means for lowering the temperature of said cheek-engaging means when said pulse-rate exceeds a preselected value and for raising the temperature of said cheek-engaging means when said pulse-rate falls below said preselected value to maintain said pulse-rate at or near said preselected value.

4,466,440

HEART PACER TIME-DOMAIN PROCESSING OF INTERNAL PHYSIOLOGICAL SIGNALS

David K. Money, Pennant Hills, and Andrew D. MacLaurin, North Epping, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Nov. 12, 1981, Ser. No. 320,338
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **23 Claims**



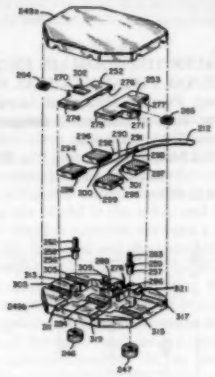
1. An implantable heart pacer comprising electrode means, means for applying a stimulating current pulse to said electrode means, means for sensing an electrical signal on said electrode means representative of cardiac activity, and means for controlling operation of said current pulse applying means in accordance with the operation of said sensing means, characterized by said sensing means including means for generating a continuous sequence of bit samples, the two stages of said bit samples representing changes in respective opposite directions in the sensed electrical signal, and means for analyzing said continuous bit sample sequence to determine the occurrence of a predetermined type of cardiac activity to control operation of said current pulse applying means in accordance therewith, and wherein said bit sample generating means operates directly on the sensed electrical signal without any prior filtering in the frequency domain and includes capacitor means, means for charging said capacitor means, means for discharging said capacitor means, means for periodically comparing the potential across said capable means with the potential of the sensed electrical signal to derive bit samples the state of each of which represents the result of the most recent comparison, means for operating either said charging means or said discharging means in accordance with the state of each bit sample to control the potential across said capacitor means to track the potential of the sensed electrical signal, a constant current source, means for causing and constant current source to be utilized by both of said charging and discharging means to effect equal but opposite increments in the potential of said capacitor means independent of which of said charging or discharging means is operated in accordance with the state of each bit sample, means for holding said charging and discharging means unoperated during operation of said comparing means and for always holding said constant current source operated, and further including means for steering current from said constant current source away from said capacitor means whenever neither of said charging and discharging means is operated.

4,466,441

IN-LINE AND BIFURCATED CARDIAC PACING LEAD CONNECTOR

Frank L. Skubitz, Andover, Minn., and James G. Delubery, Madison, Wis., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 2, 1982, Ser. No. 404,246
Int. Cl.³ H61N *1/00*
U.S. Cl. 128—419 P **4 Claims**



1. A lead connector for connecting pacing leads to a pulse generator comprising:

a housing having at least one inlet opening for an in-line electrode lead and at least one pair of spaced inlet openings for a bifurcated lead;

at least one pair of connector electrodes secured in said housing and positioned to contact the electrodes of said leads when they are inserted into said inlet opening;

at least one clamping means wherein each clamping means is associated with a pair of connector electrodes, and comprises a threaded shaft having a free end that extends into said housing, a clamping block through which said free end of said threaded shaft protrudes and a securing means which is threaded onto said free end of the said threaded shaft, wherein said securing means has a curved surface and said clamping block comprises a mating curved surface for the curved surface of said securing means, which receives and prevents said securing means from rotating independently of said clamping block and, each of said clamping blocks has a restricted passageway that allows said threaded shaft to pass therethrough so that said clamping blocks may rock to a limited extent relative to said threaded shaft by sliding of its mating curved surface on the curved surface of its associated securing means to a position limited by the diameter of said passageway, and said clamping blocks are driven toward a pair of associated connector electrodes, so as to clamp the inserted lead electrodes between integrating formed surfaces on said clamping block which extend outwardly of said threaded shaft, and the associated pair of connector electrodes, upon rotation of its associated threaded shaft in one direction, and said clamping blocks are driven away from said associated pair of connector electrodes, upon rotation of said associated threaded shaft in the opposite direction;

said housing having housing top means formed thereon which engage said clamping means and prevent said clamping means from rotating after a limited amount of rotation has occurred.

4,466,442

CARRIER LIQUID SOLUTIONS FOR THE PRODUCTION OF GAS MICROBUBBLES, PREPARATION THEREOF, AND USE THEREOF AS CONTRAST MEDIUM FOR ULTRASONIC DIAGNOSTICS

Juergen Hilmann; Rolf-Ruediger Hoffmann; Wolfgang Muetzel, and Ingfried Zimmermann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 434,034
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141641
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—653 **26 Claims**

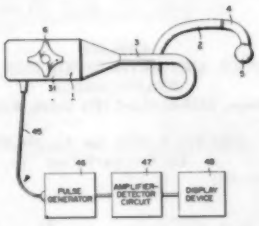
18. In a method for altering the transmission characteristics of blood to an electromagnetic or elastic wave transmitted therethrough by the steps of forming an amount of microbubbles effective to substantially alter such transmission characteristics of blood in the area thereof containing the microbubbles in an intravenously injectable physiologically acceptable aqueous carrier liquid by mechanically agitating the carrier liquid in the presence of a physiologically acceptable gas, and dispersing the microbubble-containing carrier liquid in the blood, the improvement wherein the carrier liquid is substantially free of undissolved solids, has a surface tension of less than 43 dyn/cm and a viscosity of at least 20 mPa·s, and the physiologically acceptable gas is sterile.

4,466,443

ULTRASONIC DIAGNOSTIC APPARATUS FOR EXAMINATION OF A COELIAC CAVITY

Mikio Utsugi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,409
Claims priority, application Japan, Apr. 8, 1981, 56-52837
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **16 Claims**



1. An ultrasonic diagnostic apparatus for examination of a coeliac cavity, comprising:

an insertion section including a distal end portion to be inserted into a coeliac cavity, the distal end portion forming a chamber sealed from the outside, a proximal end portion to be set outside of the coeliac cavity, said insertion section having a longitudinal axis and a drive passage extending from the chamber at the distal end portion to the proximal end portion along said longitudinal axis;

an operation section connected to the proximal end portion of the insertion section;

ultrasonic transducer means including an ultrasonic scanning member rotatably arranged in said chamber;

a rotation torque-transmitting member which loosely extends through said drive passage, one end of the rotation torque-transmitting member being operatively connected to the ultrasonic scanning member, and the other end extending to the operation section;

a liquid ultrasonic permeable medium contained in said chamber for filling said chamber and said drive passage;

sealing means at the operation section for sealing the proxi-

mal end portion of said drive passage to prevent said liquid ultrasonic permeable medium in said drive passage from entering a portion of the operation section; and

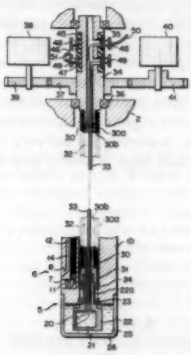
a drive power source arranged at the operation section and connected to said other end of the rotation torque-transmitting member to rotate the ultrasonic scanning member through said rotation torque-transmitting member.

4,466,444

ULTRASONIC DIAGNOSTIC APPARATUS

Kazuo Baba, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,025
Claims priority, application Japan, May 20, 1981, 56-76082
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **8 Claims**



1. An ultrasonic diagnostic apparatus, comprising:

an elongate insertion section including a flexible elongate tube having a distal end portion and a proximal end portion, for insertion into the interior of the human body with the distal end portion forward;

a control section attached to the proximal end portion of the flexible elongate tube of the insertion section;

an ultrasonic transducer arranged for rotation at the distal end portion of the flexible elongate tube of the insertion section;

a driving shaft including a flexible elongate member arranged to pass through the flexible elongate tube of the insertion section and having one end portion connected with the ultrasonic transducer and the other end portion located at the control section, the flexible elongate member comprising a pair of coils closely fitted coaxially one within the other wherein said coils have different winding directions for providing circumferential rigidity when the driving shaft is rotated;

a driving source at the control section for rotating the driving shaft to rotate the ultrasonic transducer;

a rotating member attached to the other end portion of the driving shaft at the control section, for rotation relative to the control section together with the driving shaft, the rotating member having an inside space which opens into that of the pair of coils forming the drive shaft;

a rotating terminal attached to the rotating member to rotate together with the rotating member;

a signal cable having one end portion connected with the ultrasonic transducer and the other end portion connected with the rotating terminal, wherein the signal cable passes through the inside space of the pair of coils forming the driving shaft and the inside space of the rotating member to be rotated together with the rotating member; and

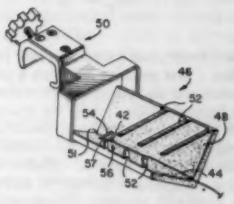
a fixed terminal at the control section normally in contact with the rotating terminal for providing an electrical connection between the signal cable and an external circuit for operating the ultrasonic transducer as said transducer is rotated by the driving source at the control section.

4,466,445

SYSTEMS AND DEVICES FOR MEASUREMENT OF URINE TEMPERATURE, PARTICULARLY FOR DETECTING THE SHIFT IN BASAL BODY TEMPERATURE IN WOMEN

Robert M. Abrams, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Sep. 16, 1982, Ser. No. 418,657
Int. Cl.³ G01N *33/16*
U.S. Cl. 128—736 **27 Claims**



1. A system for use by a human female on a daily basis upon awakening for the purpose of detecting an upward shift in basal body temperature indicative of the beginning of a period of infertility, said system comprising:

a device for measurement of urine temperature upon micturation as an indicator of body temperature, said device including an electrical temperature-sensing element;

a signal-processing subsystem electrically connected to said temperature-sensing element and operable to record daily urine temperature readings indicative of basal body temperature, to perform a statistical test for recognizing an upward shift in basal body temperature indicative of the beginning of a period of infertility, and to signal when the statistical test has been satisfied;

said device for measurement of urine temperature including a funnel having a mouth for receiving urine and an apex, a flow-through sensing portion positioned at said funnel apex for receiving urine, said flow-through sensing portion including a reservoir, and a flow-restricting drain aperture for said reservoir; and

said electrical temperature sensing element being positioned within said reservoir.

4,466,446

PLUNGER SUBASSEMBLY FOR BLOOD GAS SYRINGES

Balinderjeet S. Baidwan, and Dean H. Iwasaki, both of Denver, Colo., assignors to Marquest Medical Products, Inc., Englewood, Colo.

Continuation of Ser. No. 253,402, Apr. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 162,329, Jun. 24, 1980, Pat. No. 4,299,238. This application Jun. 20, 1983, Ser. No. 505,707
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—765 **13 Claims**

1. Apparatus for attachment to a hollow needle and used for obtaining an arterial blood sample when arterial pressure is insufficient to fill a blood-receiving space defined in the apparatus, comprising:

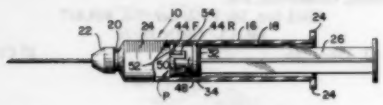
a syringe barrel having an inner surface and an open rear end and a necked down front end and a longitudinal axis extending from said rear end to said front end;

plunger means located within said syringe barrel and having a top portion and being movable relative to said syringe

barrel, said plunger means being moved to define a blood-receiving space formed between said top portion of said plunger means and said front end of said syringe barrel;

said plunger means having at least one continuous annular surface in sealing engagement with the inner surface of said syringe barrel at all times during the obtaining of said blood sample; and

said plunger means including a pushrod and a piston having a hollow interior, said piston being joined to said pushrod with a fluid impervious portion of said pushrod in said



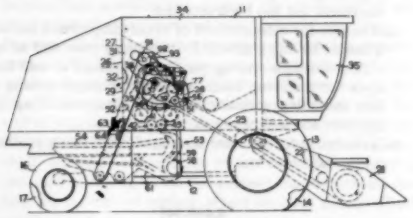
hollow interior, said piston and said pushrod cooperating to define a first position in which a passageway between said piston and said pushrod is provided for the movement of gas from the blood-receiving space through at least a portion of said interior of said piston to the ambient environment of the syringe barrel, means permitting limited movement of said pushrod relative to said piston in a direction substantially parallel to said longitudinal axis to define a second position in which said passageway is closed, said passageway being closed for use in aspirating blood into the syringe.

4,466,447

TAILINGS RETURN TO THRESHING SECTION OR TO CLEANING SECTION

Wayne A. Hoefer, Blue Springs, and Garry W. Busboom, Independence, both of Mo., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 23, 1983, Ser. No. 507,029
Int. Cl.³ A01F *12/52*
U.S. Cl. 130—27 F **8 Claims**



1. In an axial flow combine for harvesting seed, the combination comprising:

a threshing section including

a housing having walls including a pair of laterally spaced vertical side walls extending in the longitudinal direction of the combine, a pair of longitudinally spaced front and rear walls having lower portions converging downwardly, bottom wall means defining a transversely extending discharge opening permitting discharge of threshed material from the threshing section and wall means in said front wall defining a housing inlet opening for receiving crop material to be threshed,

a foramious cylindrical cage extending between said side walls, including a cage inlet opening in general alignment with said housing inlet opening for receiving crop material to be threshed, and

a threshing rotor disposed within said cage, said cage and cylinder being disposed on a horizontal axis disposed transverse to the direction of travel of said combine,

a cleaning section receiving threshed material discharged from said threshing section by way of said discharge opening, said cleaning section including means for separating light particles and tailings from the seed,

a transversely extending cylindrical trough disposed above and bridging said inlet openings in said housing and cage terminating at its laterally inner end in said housing in an elevated position in relation to said discharge opening,

an overfeed auger operatively disposed in said trough on a transverse axis and rotatably supported on said housing,

a longitudinally extending feeder conveyor having its rear end extending through said housing inlet opening and operative to move crop material to said inlet opening of said cage,

a tailings elevator connected at its lower end to said cleaning section to receive tailings and having its upper end disposed in delivery relation to said overfeed auger, and

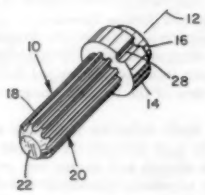
a bottom door in said trough selectively movable between a closed position wherein said tailings are delivered by said overfeed auger to said housing for gravity flow to said discharge opening of said bottom wall means without passing through said cage and without being threshed by said rotor and an open position wherein said tailings delivered to said overfeed auger drop downward onto the rear end of said feeder conveyor for delivery thereby to said inlet opening of said cage whereby said tailings are re-threshed.

4,466,448

TOBACCO SMOKE FILTER

Leslie N. Aikman, 3628 Ocean Blvd., Corona Del Mar, Calif. 92625

Filed Apr. 13, 1981, Ser. No. 253,902
Int. Cl.³ A24D *3/04*
U.S. Cl. 131—216 **2 Claims**



1. Apparatus for removing material from the smoke of cigarettes including a cigarette holder having an inlet and an outlet end and means for providing a flowpath for smoke from inlet end to the outlet end, the flowpath having an inner surface;

a porous, labyrinth type filter in that flowpath;

means for conducting a proportionate quantity of unfiltered smoke through said flowpath around said filter;

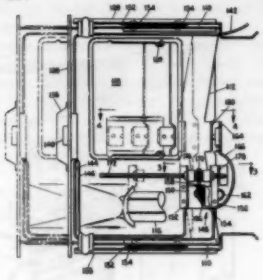
means for causing a portion of the cigarette smoke traversing said flowpath to pass through said filter and for causing a portion of said smoke to be bypassed around said filter as an incident to inhalation suction at the output end of said holder; and

said filter element comprising an elongated element having a central recess opening at one end of the element and a barrier formed at its exterior and extending between said filter element and the inner surface of said flowpath over a selected portion of said filter element whereby a selected portion of flow through said flowpath is confined to flow through said recess.

4,466,449
POWERED ASHTRAY ASSEMBLY

Larry E. Summers, Grand Rapids, Mich., assignor to GRM Industries, Inc., Grand Rapids, Mich.

Filed Nov. 16, 1982, Ser. No. 442,008
Int. Cl.³ A24F *19/00*
U.S. Cl. 131—237 15 Claims



1. In an ashtray assembly for use in an operator controlled vehicle having a battery source, wherein the assembly includes a stationary frame mounted within an assembly housing and an assembly frame slidably mounted to the stationary frame so as to be selectively retractable into a closed position within the housing and selectively extendable into an open position forward of the housing, the improvement which comprises:

power means adapted to be connected to the battery source and mounted between the assembly frame and the stationary frame for exerting forces on the assembly frame with respect to the stationary frame so as to selectively extend and retract the assembly frame;

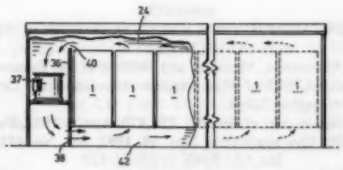
switch means electrically coupled to the power means and responsive to selective activation by a vehicle occupant for generating activating signals; and

the power means is responsive to the activating signals to exert the forces on the assembly frame.

4,466,450
TOBACCO CURING BARN

Walter Huszczo, R.R. 2, Burford, Ontario, Canada (N0E 1A0)

Filed May 27, 1982, Ser. No. 382,646
Claims priority, application Canada, Jul. 16, 1981, 381849
Int. Cl.³ A24B *3/10*
U.S. Cl. 131—300 5 Claims



1. Tobacco curing apparatus comprising in combination a plurality of removeable tobacco curing bins and a kiln including a forced air furnace means, a curing chamber having a ground floor accessible to a loading vehicle by a door at one end thereof, said curing chamber and such forced air furnace means being in communication for recirculation of curing air by means of at least one curing air supply duct and at least one curing air return duct located at lower and upper positions of the curing chamber respectively, said curing chamber having support means adapted to support within the curing chamber a horizontal abutting row of removeable tobacco curing bins having substantially air tight seals between the bins themselves and between the bins and all sides of the curing chamber but positioned vertically between the supply and return air ducts so as to form a first plenum below and second plenum above the bins within the curing chamber in communication with supply and return ducts respectively, each said bin being adapted to contain bulk packed tobacco leaves having leaf faces aligned vertically when the bin is positioned in the curing chamber and being further adapted with bottom and top openings in communication with the first and second plenums respectively, all of which is adapted to establish the forced curing air recirculation system whereby heated air may be blown at predetermined pressure and temperature from the furnace means to the supply duct(s) to the first plenum, through each of the bottom openings of the bins, about the tobacco leaves therein, out the top openings of the bins into the second plenum through the return air duct(s) and back to the furnace means for recirculation, said recirculation system having inlet means and exhaust means to controllably intake or discharge predetermined amounts of air to or from the recirculation system.

4,466,451
METHOD FOR AROMATIZING TOBACCO SMOKE

Jacques Bonnet, Lausanne; Pierre Jaccard, Bussingy, and Serge Veluz, Epalinges, all of Switzerland, assignors to Baumgartner Papiers S.A., Crissier, Switzerland

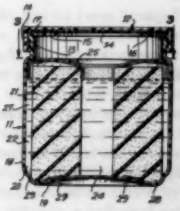
Filed Jun. 4, 1982, Ser. No. 384,944
Claims priority, application Switzerland, Jun. 10, 1981, 3787/81
Int. Cl.³ A24D *3/04, 3/14, 3/16*
U.S. Cl. 131—335 9 Claims

1. A method for aromatizing tobacco smoke drawn from a cigarette which comprises charging a highly-porous silica gel in the cigarette mouthpiece with 10–20% by weight of aroma substances selected from the group consisting of a synthetic tobacco aroma, a natural or synthetic tobacco extract, a natural or synthetic tobacco smoke extract or a phenolic ether aroma substance, wherein the adsorption capacity of said silica gel is adjusted with the deactivating agent, propylene glycol.

4,466,452
FINGERNAIL TREATMENT ARRANGEMENT

Luigi M. Ferrari, Douglaston Hills, N.Y., assignor to Del Laboratories, Inc., Farmingdale, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,328
Int. Cl.³ A45D *29/17, 29/20*
U.S. Cl. 132—75 15 Claims



1. An arrangement for treating fingernails with a treating liquid, especially with a nail polish remover, comprising:

a vessel including a circumferential wall and a bottom wall together bounding a cylindrical chamber, said bottom wall having a concave configuration as considered from outside said chamber, said bottom wall having a marginal portion merging with said circumferential wall, and a central portion raised into said chamber relative to said marginal portion;

a liquid-absorbing cylindrical porous body received in said chamber in a predetermined position and having such dimensions as to be normally radially inwardly spaced

from said circumferential wall when in said predetermined position to form therewith an annular gap into which any treating liquid on the raised central portion will tend to flow in the radially outward direction;

means for holding said porous body in said predetermined position in said chamber of said vessel; and

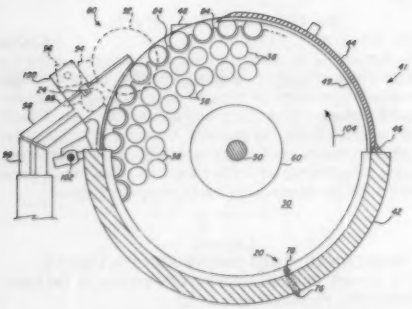
means for bounding a finger hole in said porous body for insertion of a finger thereinto for treatment of the respective fingernail by the treating liquid absorbed in said porous body.

4,466,453

COIN COUNTING AND SORTING APPARATUS

Adil S. Said, Dallas, and Antonio Schober, Richardson, both of Tex., assignors to Global Banking Systems, Inc., Garland, Tex.

Filed Jun. 16, 1982, Ser. No. 388,962
Int. Cl.³ G07D *3/10*
U.S. Cl. 133—3 C **3 Claims**



1. Coin sorting and counting apparatus comprising:

an annular drum inclined at a fixed angle with respect to the horizontal;

a plurality of spaced apart sorting plates rotatably disposed within said annular drum, each of said plates having a plurality of openings therein configured to retain coins of a particular size while permitting coins of a smaller size to pass therethrough, wherein each of said sorting plates includes an annular row of openings therein disposed adjacent its periphery, said annular row of openings being formed on a surface recessed from the upper surface of said sorting plate a distance substantially equal to the thickness of a coin to be retained thereon, said sorting plate further including a plurality of arcuate projections extending radially outward and downward from said upper surface of said sorting plate to said recessed surface to a distance slightly less than the radius of one of said coins to be sorted, the outermost portion of each of said arcuate projections being narrower than the innermost portion, and wherein each of said openings has a larger countersunk opening therebeneath extending partially upward from the lower surface of said sorting plate;

first drive means operable coupled to said plurality of sorting plates; and

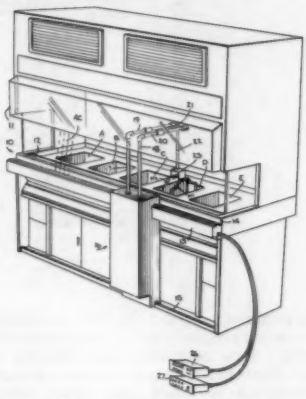
a plurality of coin ejector means each cooperatively disposed at the periphery of one of said plurality of sorting plates for removing coins therefrom.

4,466,454

AUTOMATED WORK TRANSFER SYSTEM

Howard M. Layton, New Fairfield, Conn., assignor to Interlab, Inc., Danbury, Conn.

Filed Nov. 23, 1982, Ser. No. 443,894
Int. Cl.³ B08B *3/04*
U.S. Cl. 134—76 **7 Claims**



1. In combination with a work station provided with a bench having a row of chemical processing stages thereon each having a tank adapted to receive a basket carrying the work, the atmosphere above the stages being corrosive and being isolated from the external atmosphere by an air curtain; an automated work transfer system to convey said basket in a desired sequence to said stages, said systems comprising:

A. a supporting rail laterally displaced from said row of stages and parallel thereto; and

B. a robot riding on said rail provided with a vertical shaft having an arm cantilevered therefrom and extending into the corrosive atmosphere to support a hand holding the basket whereby the robot otherwise lies in the external atmosphere and is isolated from the corrosive atmosphere, said robot further including first drive means to advance the robot along the rail to a position aligning the hand with a selected stage and second drive means to lower or raise the shaft to lower the basket held by the hand into the tank of the selected stage or to hoist it therefrom.

4,466,455

ROLLING DIAPHRAGM VACUUM CONTROL WITH CHECK VALVE

Christos Athanassiu, Medford, and Wilfred H. St. Laurent, Jr., Marblehead, both of Mass., assignors to Bellofram Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 251,470, Apr. 6, 1981, Pat. No. 4,390,036. This application Nov. 18, 1982, Ser. No. 442,704
Int. Cl.³ F16K *7/02, 31/126*
U.S. Cl. 137—116.5 **2 Claims**

1. A pressure controller for maintaining a defined vacuum pressure to a remote location, comprising:

a. a housing defining a cavity;

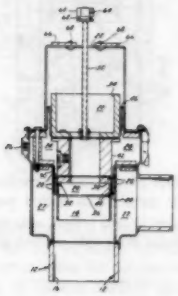
b. first and second plungers adapted to reciprocate in said housing, said plungers being attached to each other by means of a hollow rigid member such that they move together, said first plunger including a side wall defining a port;

c. first and second flexible diaphragms, acting to seal between said first plunger and said housing and between said second plunger and said housing, respectively;

d. said housing, plungers and diaphragms defining first, second, third and fourth chambers in said cavity;

e. wherein said housing defines:
i. a port into said first chamber for constant fluid communication with atmosphere;
ii. a port into said second chamber for constant fluid communication with said remote location;
iii. a port into said third chamber for constant fluid communication with a control signal pressure;
iv. a port into said fourth chamber for constant fluid communication with a high vacuum;
v. a port between said second and fourth chambers to permit fluid communication between them; and

f. valving means provided by said diaphragms for opening and closing fluid communication between said first and second chambers through the port in said plunger and between said second and fourth chambers through the port between them;



g. such that, if the pressure at said remote location is too low, the fluid pressures in said chambers will cause said plungers to move so that fluid communication is opened between said first and second chambers and is closed between said second and fourth chambers; and

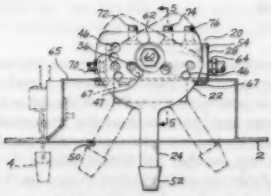
h. such that, if the pressure at said remote location is too high, the fluid pressures in said chambers will cause said plungers to move to close fluid communication between said first and second chambers and to open fluid communication between said second and fourth chambers; and further comprising a check valve located in an opening between said first chamber and said third chamber to permit fluid to flow from said first chamber into said third chamber but to prevent fluid from flowing from said third chamber into said first chamber.

4,466,456

PROGRAMMABLE MULTIPORT SWITCH

Gary P. Hansen, Federal Way, Wash., assignor to Red Dot Corporation, Seattle, Wash.

Filed Nov. 22, 1982, Ser. No. 443,232
Int. Cl.³ F16K *11/14, 31/524*
U.S. Cl. 137—596.2 **22 Claims**



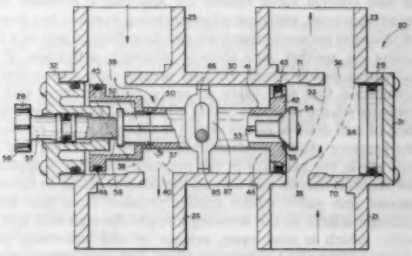
1. A switch comprising:
a valve housing including a passageway that has at least one port;
a valve stem positioned to reciprocate longitudinally in the passageway to control said port, said stem including a head and having a first position and a second position;
biasing means for biasing the stem toward its first position; and
a movable member positionable adjacent to a housing surface and movable in a direction essentially perpendicular to the direction of reciprocation of the stem, said movable member including an essentially flat surface portion and at least one cavity, the positioning of said surface portion and said cavity being programmed to bring one of said portion and said cavity into alignment with the valve stem head when the movable member is in any one of a plurality of predetermined positions;
wherein, when said surface portion is moved into alignment with the head, said portion bears against the head and moves the stem inwardly against the force of the biasing means into its second position; and when said cavity is moved into alignment with the head, the stem is urged into its first position by the biasing means; and
wherein, when the stem is in its first position, an outer portion of the head extends into the cavity and an inner portion of the head is seated against an edge portion of the cavity.

4,466,457

BYPASS AND HARD WATER MIX VALVE

Earl P. Brane, 9470 Ulmerton Rd., Largo, Fla. 33541; Douglas K. Brane, 3 N. Pine Cir., Belleair, Fla. 33516, and Hilton H. Hammond, 6644 Gulfport Blvd., St. Petersburg, Fla. 33707

Filed Feb. 18, 1982, Ser. No. 350,069
Int. Cl.³ F16K *11/18*
U.S. Cl. 137—599.1 **15 Claims**

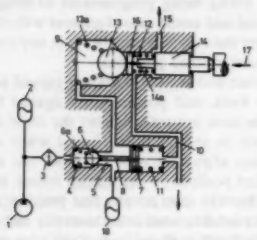


1. A bypass and hard water mix valve comprising:
a main body having an inlet passage with a first end connectable to a source of hard water and a second end connectable to a water softening means, said main body further having an outlet passage connectable to said water softening means and an intermediate passage leading from said inlet passage between said first end and second end to said outlet passage;
bypass valve means slidably mounted in said intermediate passage being operable to move from a closed position whereat water flows from said inlet passage through said water softening means and out said outlet passage to an open position whereat all water flowing into said inlet passage from said first end is directed through said intermediate passage to said outlet passage; and,
hard water mix valve means movably mounted in said intermediate passage and operably associated with said bypass valve means to release controlled portions of water from said inlet passage through said intermediate passage to said outlet passage when said bypass valve is in said closed position,

4,466,458
CONTROL VALVE

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,948
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215740
Int. Cl.³ F16K *11/10, 31/124*
U.S. Cl. 137—606 3 Claims



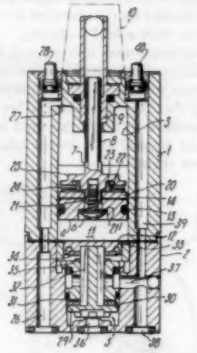
1. A control valve system for the application of a desired pressure in a working circuit, which comprises: a pressure chamber connected with a first pressure source, a control chamber, a working circuit and a pressureless connection connected to said control chamber, a first seat valve which separates said pressure chamber from said control chamber, an activating piston positioned relative to said first seat valve for opening said seat valve and for closing off said pressureless connection during operation of said activating piston, a second pressure source, a second seat valve interposed between said second pressure source and a connection with said pressure chamber, a control piston positioned relative to said second seat valve for opening said second seat valve during operation of said control valve system for applying a pressure in the working circuit, said control piston being exposed to a pressure of said first pressure source on one face thereof and to a force spring on another face thereof, whereby activation of said activating piston closes off said pressureless connection and opens said first seat valve to apply pressure from said first pressure source to said working circuit and to said force spring face of said control piston which is exposed to the pressure in the pressure chamber subsequent to opening of said first control valve, the pressure in the pressure chamber is applied to the working circuit and acts on the control piston to open said second seat valve which applies pressure from said second pressure source to the working circuit, through said first seat valve which is now open, release of said activating piston closes said first seat valve, and opens said pressureless connection to relieve said working circuit of pressure thereby relieving pressure on the control piston which permits said second seat valve to close.

4,466,459
PNEUMATIC TIMER WITH SPIRAL THROTTLE

Godfrey A. Higgins, Camborne, England, assignor to Compair Maxam Limited, Redruth, England

Filed Sep. 9, 1982, Ser. No. 416,511
Claims priority, application United Kingdom, Oct. 12, 1981, 8130752
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—624.11 13 Claims

1. In a variable pneumatic timer for operating a pneumatic valve, said timer comprising a cylinder (3) and a piston (4) in said cylinder, said cylinder and piston defining an air chamber (11), means (7–10) for adjusting the position of said piston in said cylinder to vary the volume of said chamber, means defining an air inlet for the supply of air to said chamber, a throttling device in said inlet to control the rate of air flow into said chamber, a pneumatic valve (5), a member (12) for controlling said pneumatic valve, and means movably mounting said member in a wall of said chamber whereby said member is moved to operate said valve when a predetermined air pressure is reached in said chamber, the improvement wherein said throttling device comprises a disc (14), means (16) defining a substantially spiral groove (17) in a flat face of said disc, a seal (20)

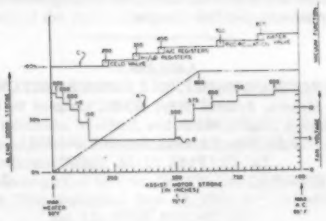


applied to said flat face of said disc to enclose said groove and form a substantially spiral open ended passage, and means incorporating said disc in said piston, and said inlet leading to a space in said cylinder on a side of said piston remote from said chamber.

4,466,460
VALVE APPARATUS WITH IMPROVED MEANS TO PREVENT CROSS-VENTING

John W. Orcutt, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 206,936, Nov. 14, 1980, abandoned, which is a continuation of Ser. No. 59,005, Jul. 19, 1979, abandoned, which is a division of Ser. No. 803,530, Sep. 6, 1977, Pat. No. 4,206,645, which is a division of Ser. No. 501,711, Aug. 29, 1974, Pat. No. 4,063,682, which is a continuation-in-part of Ser. No. 422,954, Dec. 7, 1973, abandoned. This application May 14, 1982, Ser. No. 378,374
Int. Cl.³ E03B *3/00*
U.S. Cl. 137—625.2 5 Claims



1. Valve apparatus having improved means to prevent cross-venting comprising a first member having a surface with at least one port in communication therewith, the port having a selected diameter and being connectable to control means, a second member having a surface generally parallel to the surface of the first member and biased thereagainst, the surfaces being slidably movable relative to one another, at least one passageway defined on the surface of the second member and aligned with the port, the passageway having first and second portions separated from one another by a pair of protrudences extending from the surface of the second member and culminating in contact portions, the contact portions

spaced apart greater than the diameter of the port to preclude communication between the first and second passageway portions upon sliding movement of the surfaces relative to one another.

4,466,461

VALVE

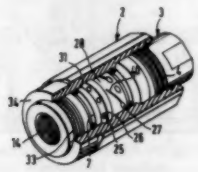
Johann Weiss, Hauptstrasse 19, D-7799 Illmensee, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,866

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110907

Int. Cl.³ F16K 5/12

U.S. Cl. 137—625.3 **23 Claims**



1. A control component for a hydraulic system, comprising: an outer member having an inside surface; a body portion disposed in the outer member for relative movement therebetween and having an outside surface co-operable with the inside surface of said outer member; a hydraulic fluid inlet means; a hydraulic fluid outlet means; flow duct means extending between said hydraulic fluid inlet means and said hydraulic fluid outlet means and including at least one flow passage opening at its end in the flow direction at said outlet surface of said body portion; and at least one curved channel portion extending in said outside surface of said body portion from said opening of said at least one flow passage at an acute angle of inclination to a radial plane through said body portion wherein the depth and width of said at least one curved channel portion progressively and continuously decreases in size from said opening to the tip of said at least one curved channel portion and the length of said at least one curved channel portion is greater than the length of said opening and less than the circumference of the outside surface of said body portion.

4,466,462

CIRCUITOUS PATH FLOW RESTRICTOR

Hugh C. Morris, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00132, § 371 Date Feb. 1, 1982, § 102(e) Date Feb. 1, 1982, PCT Pub. No. WO83/02647, PCT Pub. Date Aug. 4, 1983

Continuation of Ser. No. 361,696, Feb. 1, 1982, abandoned. This PCT application Feb. 1, 1982, Ser. No. 546,080

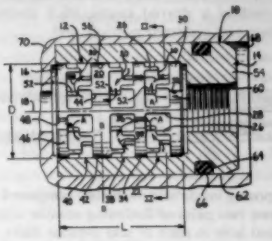
Int. Cl.³ F15D 1/04

U.S. Cl. 138—42 **12 Claims**

1. A circuitous path flow restrictor (10) comprising:

fluid director means (12) for defining a core (24) having a central axis (18), a plurality of longitudinally oriented fins (26) extending from the core (24) and defining alternately axially offset notches (50,52), and a single longitudinally oriented blocking fin (28) extending from the core (24); and

body means (14) for encircling the fluid director means (12) and defining an ingress passage (32), an egress passage (36), and a serpentine fluid flow path (58) via the notches (50,52) and in use causing fluid to enter the ingress passage (32) adjacent the blocking fin (28), travel peripherally about the core (24) in the serpentine fluid flow path (58),



and exit the egress passage (36) adjacent the opposite side of the blocking fin (28) in a single fluid flow path.

4,466,463

DISK PAIRS INSIDE PACKAGE ARTICLE FOR AUTOMATICALLY AND CONTINUOUSLY MAKING SAUSAGES WITH FLAT ENDS

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 429,395

Int. Cl.³ A22C 11/02; F16C 11/00

U.S. Cl. 138—118.1 **24 Claims**

1. A package article comprising a shirred casing having at least one unshirred portion and having disposed inside said unshirred portion at least two pairs of flattening annular disks, there being a central hole in each of said annular disks, said flattening annular disks being detachably-attached in pairs, at least one disk of the pair being fixedly-attached by flexible means to a disk of an adjoining pair.

16. A method of making a package article for use in automatically and continuously stuffing food product employing at least one shirred casing stick which comprises:

(a) providing a casing stick having an unshirred portion and a shirred portion, and

(b) disposing inside said unshirred portion of said casing stick at least two pairs of flattening annular disks, there being a central hole in each of said annular disks, said pairs being detachably-attached, at least one disk of each pair being fixedly-attached by means of a flexible tubular membrane to a disk of an adjoining pair.

4,466,464

OVERWRAPPED DISK PAIRS IN A PACKAGE ARTICLE FOR AUTOMATICALLY AND CONTINUOUSLY MAKING SAUSAGES WITH FLAT ENDS

Vytautas Kupcikevicius, and Vytas A. Raudys, both of Chicago, Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 430,897

Int. Cl.³ A22C 11/02; F16C 11/00

U.S. Cl. 138—118.1 **20 Claims**

1. A package article comprising a shirred casing having at least one unshirred portion containing at least two pairs of flattening annular disks, there being a central hole in each of said annular disks, said pairs being detachably-attached, at least one disk of each pair being fixedly-attached by flexible means to a disk of an adjoining pair, said pairs of disks being overwrapped with a rigid or flexible material.

11. A method of making a package article for use in automatically and continuously stuffing food product employing at least one shirred casing stick which comprises:

(a) providing a shirred casing stick having an unshirred portion and a shirred portion, and

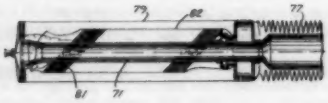
(b) disposing inside said unshirred portion of said casing stick at least two pairs of flattening annular disks, there being a central hole in each of said annular disks, said pairs being detachably-attached, at least one disk of each pair being fixedly-attached by means of a flexible tubular membrane to a disk of an adjoining pair, said pairs of disks being overwrapped with a rigid or flexible material.

4,466,465

PACKAGE ARTICLE FOR AUTOMATICALLY AND CONTINUOUSLY MAKING SAUSAGES WITH FLAT ENDS

Paul H. Frey, LaGrange, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 431,535
Int. Cl.³ F16L *11/00*; A22C *11/02*
U.S. Cl. 138—118.1 **10 Claims**



1. A package article comprising a shirred casing having at least one unshirred portion and having disposed inside said unshirred portion at least two flattening annular disks, there being a central hole in each of said annular disks, each of said annular disks having a diameter less than the casing burst diameter for casing.

4,466,466

OVERWRAPPED DISKS IN A PACKAGE ARTICLE FOR AUTOMATICALLY AND CONTINUOUSLY MAKING SAUSAGES WITH FLAT ENDS

Vytas A. Raudys, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 432,053
Int. Cl.³ A22C *11/02*; F16L *11/00*
U.S. Cl. 138—118.1 **5 Claims**

1. A package article comprising a shirred casing having at least one unshirred portion and having disposed inside said unshirred portion at least two flattening annular disks, there being a central hole in each of said annular disks, said annular disks being overwrapped with a rigid or flexible material.

5. A method of making a package article for use in automatically and continuously stuffing food product employing at least one shirred casing stick which comprises:

(a) providing a casing stick having an unshirred portion and a shirred portion, and

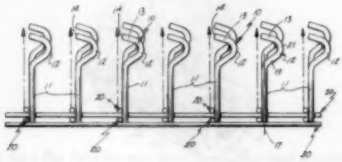
(b) disposing inside said unshirred portion of said casing stick at least two flattening annular disks, there being a central hole in each of said annular disks, said annular disks being overwrapped with a rigid or flexible material.

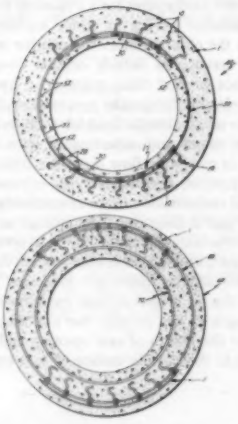
4,466,467

STACKABLE STIRRUP MAT

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Filed Jun. 18, 1979, Ser. No. 49,274
Int. Cl.³ F16L *55/00*
U.S. Cl. 138—175 **3 Claims**





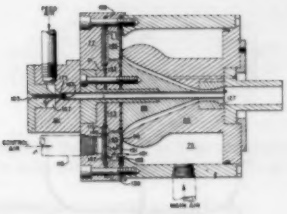
1. A stirrup mat for reinforcing concrete pipe or the like wherein each of a plurality of stirrup projections is joined to one of a plurality of base wires which in turn are joined to a plurality of tie wires such that the stirrup projections project out of the plane defined by the base wires and tie wires, wherein the improvement comprises: each said stirrup projection including a generally vertically extending leg having a longitudinal axis and a generally laterally extending anchor having a lateral extremity, said leg and said anchor being so configured that the lateral extremity of said anchor projects towards but does not project to any significant degree beyond a vertical plane passing through and extending along the base wire to which the stirrup projection is joined, each said projection has a generally question mark configuration including a bottom portion extending away from said longitudinal axis, an intermediate portion extending generally parallel to said longitudinal axis, and a top portion of the question mark comprising said laterally extending anchor of said projection and which top portion extends towards said longitudinal axis and said vertical plane, said question mark opening toward said vertical plane.

4,466,468

STRAND DELIVERY SYSTEM

Charles W. Brouwer, East Greenwich; Larry C. Cowan, Saunderstown; Robert Horton, Warwick, and Karl W. Wueger, Wakefield, all of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Aug. 6, 1979, Ser. No. 64,395
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **33 Claims**



1. An intermittently-operating strand delivery system comprising;

(1) a nozzle passageway through which the strand is guided;

(2) a supply for pressurized medium;

(3) conduit means connecting between said nozzle passageway and said supply including a pressure-operated on-off flow valve, and

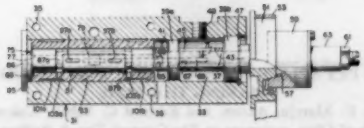
(4) separate servo means for independently applying and releasing control pressure respectively to and from said pressure-operated flow valve to move the same alternately between open and closed position to permit the medium to flow from said supply through said nozzle passageway for a controlled interval to emit a pulse of said medium from said nozzle passageway and project a length of said weft strand therefrom.

4,466,469

AIR WEFT INSERTION NOZZLE CONTROL SYSTEM

Charles W. Brouwer, East Greenwich, R.I., and Karl W. Wueger, Uster, Switzerland, assignors to Leesona Corporation, Warwick, R.I.

PCT No. PCT/US81/00017, § 371 Date Jan. 7, 1981, § 102(e) Date Jan. 7, 1981, PCT Pub. No. WO82/02411, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 7, 1981, Ser. No. 273,849
Int. Cl.³ B03B *47/30*; B65H *17/32*
U.S. Cl. 139—435 **17 Claims**



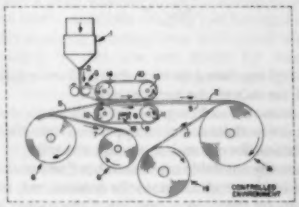
1. A control system for an intermittently-operating strand delivery system including: a nozzle passageway through which the strand is guided, a supply for pressurized medium, and conduit means connecting between said nozzle passageway and said supply including a pressure-operated on-off flow control valve, which is normally open under the pressure of said medium, said control comprising a source of pressurized control medium; means for adjusting the magnitude of the pressure of said control medium, and servo valve means for alternatively applying and releasing control medium under said adjusted pressure to and from said pressure-operated flow control valve which servo means comprises a rotary spool and a housing in which said spool is rotatably disposed in generally pressure-tight relation, said housing having at a given point in the periphery thereof a delivery port in communication with said flow control valve, and said spool having at points around its periphery separated by a predetermined arc a venting passage adapted to be in communication with the ambient atmosphere and a feed passage adapted to be in communication with said source of control medium at said adjusted pressure, said venting and feed passage being brought in succession into registry with said housing delivery port during rotation of said spool to successively release said control medium pressure from and re-apply the same to said housing port and thence said control valve, the period required for the re-applied control medium to return to the magnitude of said adjusted control medium pressure varying with the latter.

4,466,470

LITHIUM BATTERIES WITH ORGANIC SLURRY CATHODES

Alan H. Bruder, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 20, 1982, Ser. No. 341,195
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1.1 **2 Claims**



2. The method of making a lithium battery comprising the steps of dewatering MnO_2 by heat treatment, mixing said dewatered MnO_2 and carbon black with a substantially anhydrous solution of a lithium salt in an organic solvent to form a slurry, said slurry being free of any binder material, placing a thin flat electrolyte permeable separator in contact with a thin flat sheet of lithium, depositing a quantity of said slurry on said separator on the side of said separator opposite said lithium sheet, and encapsulating said slurry deposit, said separator and said lithium sheet in a solvent impermeable enclosure.

4,466,471

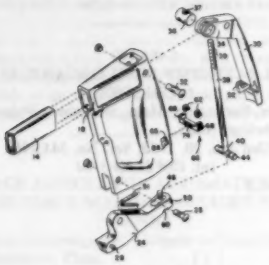
HACKSAW WITH IMPROVED BLADE-TENSIONING MECHANISM

Morton W. Thomson, Boylston, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.

Filed Jul. 7, 1983, Ser. No. 511,531
Int. Cl.³ B23D *49/12*
U.S. Cl. 145—33 A **10 Claims**

1. In a hacksaw of the type having a generally vertical front frame member, a blade-mounting front pin provided at the lower end of the front frame member, a horizontal top frame bar attached at its forward end to the upper end of the front frame member, a frame handle attached at its upper end to the rear end of the horizontal top frame bar, a rocker arm pivotally mounted on the lower portion of the frame handle, a blade-mounting back pin provided on a first portion of the rocker arm, a hacksaw blade fitted on and mounted between the front pin and the back pin, a manually movable lever pivotally attached adjacent its upper end to the frame handle, the lever having a rod-mounting portion located forwardly of the lever pivot point, a tension rod pivotally attached at its upper end to the rod-mounting portion and hanging downwardly therefrom, the tension rod cooperating at its lower end with a second portion of the rocker arm, the movable lever and the

tension rod pivot points being located with relation to each other such that pivoting the lever clockwise towards the frame handle causes the tension rod to be lifted, and pivoting the lever counter-clockwise away from the frame handle causes the tension rod to be lowered, latch means for locking the lever to the frame handle, the lever pivoting clockwise to increase blade tension, and pivoting counter-clockwise to decrease blade tension, and adjustable blade tensioning means cooperating with the tension rod for altering the distance between the second portion of the rocker arm and the tension rod pivot point, an improvement to said adjustable blade tensioning means comprising:



(a) the rod-mounting portion being fixed against rotation about the axis of the tension rod;

(b) the tension rod being rotatable about its own axis and being screw threaded at its upper end onto the rod mounting portion for up and down adjustment;

(c) a manually rotatable cross-member fixed to the lower end of the tension rod to rotate the tension rod; and

(d) means on the second portion of the rocker arm for engaging and positively preventing rotation of said cross-member when said cross-member is in contact with the rocker arm.

4,466,472

WEB OR SHEET FASTENED TO AN ARTICLE

Johannes W. J. Hendrickx, Terborg, Netherlands, assignor to Vredestein N.W., Netherlands

Filed May 29, 1981, Ser. No. 268,158

Claims priority, application Netherlands, Jun. 5, 1980, 8003295

Int. Cl.³ B60C *5/02*

U.S. Cl. 152—349 **4 Claims**

1. A sealing structure comprising:

a first tubular member (**11**) having a radially outwardly extending flange (**12**) with at least one axially extending recess (**13**) defined thereon having a substantially semi-circular cross section of a first diameter, said recess having one wall (**14**) with a curvature of a diameter greater than said first diameter with a tapered conical surface portion tapered outwardly from said recess, said recess also having an opposite substantially axial wall (**15**), said recess (**13**) and walls (**14,15**) curved smoothly with each other;

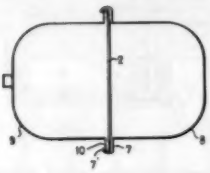
a second tubular member (**10**) having an axially protruding surface (**17,19,20**) which is curved smoothly, said second member position to engage said first member with said axially protruding surface of said second member facing said flange recess (**13**), said axially protruding surface having a tapered conical area (**19**) juxtaposed with said one wall (**14**) of said recess and a tapered area (**20**) juxtaposed with said opposite wall (**15**) of said recess to define a varying space between said flange recess and said axially protruding surface, said varying space at least partially extending from said one wall toward said opposite wall;

said flange (**12**) and said axially protruding surface both being curved at outer ends thereof which face each other to form an outer part of said varying space;

an elastomeric web (**2**) having a uniform thickness which is greater than at least portions of the varying space so that the web is squeezed by varying amounts between the first member flange and the second member surface; and

fastening means (**16,18**) acting between said first member flange and said second member surface to hold them together in a direction perpendicular to a major extension of said web.

2. A sealing structure according to claim **1**, wherein said first member comprises a valve stem, said web comprising a vehicle



tire inner tube having an opening therethrough for receiving said valve stem, said second member comprising a counter member with an opening therethrough for receiving said valve stem and holding a portion of said vehicle tire inner tube against said flange, said fastening means comprising a locking cam (**16**) formed on an outer surface of said valve stem forming a step facing said flange, said counter member having a diameter smaller than said locking cam adjacent said step so that said step engaged over said counter member with said counter member engaged to said valve stem.

4,466,473

TIRE PLY SPLICE CONSTRUCTION AND METHOD OF MAKING THE SAME

Frank E. Matyja, Akron, and Edward C. Sebak, Uniontown, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Feb. 22, 1983, Ser. No. 468,432

Int. Cl.³ B60C *9/04*

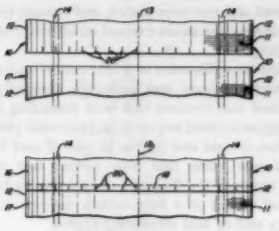
U.S. Cl. 152—354 R **8 Claims**

1. A method of making a radial ply pneumatic tire, which comprises the steps of:

(a) placing a layer of ply stock having parallel cords on a tire carcass with the sides of the ply layer extending outwardly to the area of bead placement and the parallel cords extending across the sides of the ply layer in a direction that becomes radial when the tire carcass is expanded into a toroidal shape;

(b) making a plurality of cuts in one end edge of the ply layer in a direction generally transverse to the parallel cords,

thereby cutting the cords nearest the end edge into separate sections;



(c) overlapping the cut edge with the other edge of the ply layer to form an annular layer of ply stock on the carcass; and

(d) completing the construction of the tire.

4,466,474

DEVICE FOR ROTATING A SUNSHADE STRIP ENCLOSED IN AN EVACUATED GLASS TUBE

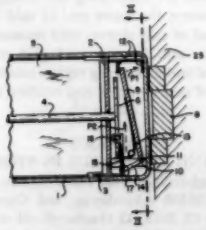
Gerhard Söllner, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1982, Ser. No. 392,113

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126038

Int. Cl.³ E06B *3/32*

U.S. Cl. 160—107 **9 Claims**



1. A thermally insulating transparent wall element, which comprises a plurality of paraxially, adjacently arranged evacuated transparent tubes; a shaft arranged axially in each transparent tube and journalled therewithin; an elongate sunshade strip mounted on each shaft; a ratchet wheel supported on one end of each shaft and having at its circumference engaging elements situated at the same angular distance from one another; an externally operable pawl cooperating with the engaging elements of the ratchet wheel to advance the same in stepwise manner; means to drive the pawl; and a member coupled to the pawl drive means for latching the ratchet wheel at the end of each movement step, said member being releasable from the ratchet wheel by said pawl drive means just before the start of the next movement step.

4,466,475

DEVICE FOR DRIVING AND STOPPING A ROLL BLIND

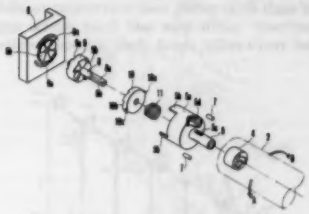
Yasuji Saito, and Hiroomi Yamanaka, both of Chiba, Japan, assignors to Kabushiki Kaisha Nichibei, Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,556

Claims priority, application Japan, Nov. 16, 1981, 56-171294; Apr. 16, 1982, 57-55710; Oct. 15, 1982, 57-155839

Int. Cl.³ E06B *9/208*

U.S. Cl. 160—297 **3 Claims**



1. A device for driving and stopping a roll blind including a blind cloth and a cloth winding roll for winding up or unwinding said blind cloth, said cloth winding roll having a coil spring for constantly applying rotating force to the cloth winding roll in cloth winding up direction and means for stopping said winding roll against the action of said coil spring to stop the blind cloth at a desired height, which comprises a clutch drum supporting member fixedly mounted in said winding roll in coaxial relation therewith, a clutch drum loosely fitted in said supporting member in coaxial relation therewith and rotatably supported at its one end on one of roll blind supporting brackets so that it can rotate at a perdetermined angle relatively to said bracket, a connecting member movably mounted in said clutch drum to project from said clutch drum to connect the supporting member with said clutch drum and retract in said clutch drum to disconnect the supporting member from the clutch drum, and a clutch mechanism for retracting said connecting member into the clutch drum to allow free rotation of said winding roll when the blind cloth is moved downward, then projecting said connecting member from the clutch drum when the downward movement of the blind cloth is stopped and retracting said connecting member into the clutch drum again when the blind cloth is slightly moved downward from said stopped position, the clutch mechanism comprises a clutch shaft rotatably mounted in said clutch drum for rotation to right and left within a predetermined angle to move said connecting member to its projected and retracted positions, a first clutch wheel integrally formed on said clutch shaft, a second clutch wheel loosely fitted on said clutch shaft for axial movement relative to said clutch drum and a spring for resiliently urging these clutch wheels together, said first clutch wheel and said one of roll blind supporting brackets being formed on their contacting surfaces with a number of clutch dogs which only allow the rotation of the first clutch wheel in the cloth descending direction, said first clutch wheel and said second clutch wheel being formed on their contacting surfaces with the same number of clutch dogs which only allow the transmission of the rotation of the second clutch wheel in said direction of the first clutch wheel.

4,466,476

DECORATIVE FABRIC DRAPERY SYSTEM

Lyman N. Fairbanks, Arlington, Va., assignor to Kenfair Manufacturing Co., Alexandria, Va.

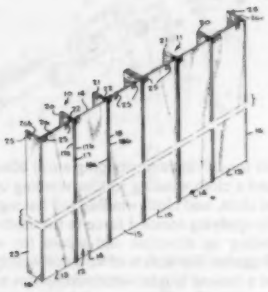
Filed Jun. 21, 1983, Ser. No. 506,856

Int. Cl.³ A47H *23/02*

U.S. Cl. 160—330 **15 Claims**

1. A decorative fabric drapery system forming draw drapes arranged as a pair of drapery modules to be supported from a conventional traverse rod mechanism or the like mounted on

an adjacent wall surface and movable from extended closed position to retracted open position flanking a wall area to be framed thereby, the drapery modules each comprising an integral fabric web of chosen drapery height formed into three vertically elongated rectangular outwardly facing front panels of a predetermined panel width such that two of such panel widths collectively equal a selected minimum open drapery module span and an intervening rearfold panel between each pair of such front panels, the fabric web for each module also including drapery seam formations laterally bounding said front panels along their full height defining the opposite vertical edges of each front panel, said intervening rearfold panels being of narrower width than said front panels appropriate when folded rearwardly about their vertical center line to



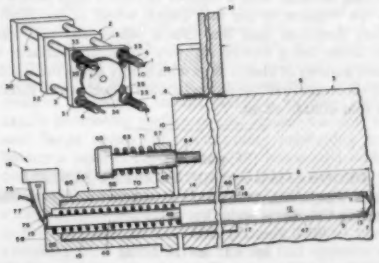
extend substantially to said adjacent wall surface, means for securing together opposite vertical edge portions of said respective rearfold panels immediately adjacent and joining said seam formations of the pair of said front panels flanking the same to retain the rearfold panels in such rearwardly folded condition, the middle front panel of said three front panels being connected to the traverse rod system to be folded rearwardly into collapsed position disposing its opposite laterally bounding seam formations in substantially abutting relation when the drapery modules are drawn to retracted open position, and means at the tops of the outermost front panels flanking said middle front panel retaining said outermost front panels continuously in fully extended flat condition so that they always remain in a common vertical plane at both the closed and open positions of the drapery system.

4,466,477

DIE CASTING MACHINE WITH STRAIN GAUGE

Wayne J. Alofs, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 21, 1981, Ser. No. 332,965
Int. Cl.³ B22D *17/32*
U.S. Cl. 164—150 **9 Claims**



1. In a die casting machine of the type having a front stationary platen and a rear plate with tie bars connected therebetween; a movable platen slidably mounted on said tie bars between said front platen and said rear plate; means between said rear plate and said movable platen for advancing said movable platen, whereby tensile force is created in said tie bars when molten metal is injected into a die located between said front platen and said movable platen; and a strain gauge assembly for determining the strain exerted on at least one of said tie bars, comprising:

an elongated bore disposed in a first end of said one tie bar, and extending along and generally coaxially with the longitudinal axis thereof; said bore extending into a measuring region located between said movable platen and the connection of said one tie bar to one of said front platen and said rear plate; said bore having one end thereof opening through the first end of said one tie bar, and the other end closed at a base which defines an innermost boundary end of said measuring region;

a stepped shoulder formed in the bore of said one tie bar; said stepped shoulder being located between said movable platen and the connection of said one tie bar to said one of said front platen and said rear plate, and defining the outermost boundary end of said measuring region;

a detector rod telescopingly received in said bore, so as to be free to reciprocate slidingly in said bore; said rod having an inner end abutting said base, and an outer end;

a sleeve slidingly received over said detector rod; said sleeve having an inner end abutting said shoulder, and an outer end; said sleeve being freely translatable in the longitudinal direction both in said bore and over said detector rod;

a housing telescopingly received over an exterior portion of said sleeve, and having a shoulder portion thereof in abutting contact with the outer end of said sleeve;

a first spring having one end thereof connected with said detector rod and the other end connected with said housing whereby said detector rod is biased continuously against said bore base;

a collar extending from said housing disposed adjacent to and spaced apart from the first end of said one tie bar, said collar including an aperture extending therethrough;

a pin anchored to the first end of said one tie bar extending through said aperture, said pin including an enlarged head;

a second spring mounted on said pin pretensed between said collar and the head of said pin whereby the inner end of said sleeve is biased continuously against said shoulder; and

measuring means for measuring the change in the relative position between the outer end of said detector rod and the outer end of said sleeve, said measuring means being connected to said housing and said rod, whereby the elongation of said measuring region can be detected by the movement of said detector rod relative to said sleeve.

4,466,478

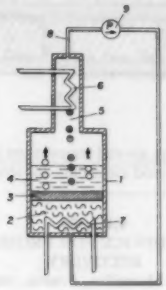
METHOD AND APPARATUS IN STORING HEAT

Bo Carlsson, Murkelvägen 118; Hans Stymne, S. Skogsrundan 21, both of S-18400 Åkersberga, and Gunnar Wettermark, Lundblads väg 12, S-18233 Danderyd, all of Sweden

PCT No. PCT/SE80/00212, § 371 Date Apr. 2, 1981, § 102(e) Date Apr. 2, 1981, PCT Pub. No. WO81/00574, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 19, 1980, Ser. No. 253,762
Claims priority, application Sweden, Aug. 22, 1979, 7907021
Int. Cl.³ F28D *21/00*
U.S. Cl. 165—1 **8 Claims**

1. A method for storing and removing heat in a reflux boiling direct contact heat exchange by the melting and crystallization of a bulk of heat-of-fusion storage medium in a closed system containing one or more chemical compounds, wherein the storage medium is brought into direct contact with a heat transfer medium having a density which is higher or equal to the density of the storage medium liquid phase and having insignificant solubility in the storage medium and being capable of taking up heat from the storage medium through vap-

orization, which comprises vaporizing the heat transfer medium in the bulk of the storage medium, thereby transferring said heat transfer medium to a vapor space above the storage medium until an equilibrium is attained between the



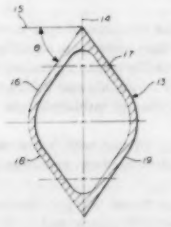
heat transfer medium liquid phase in the storage medium and its vapor in the vapor space without solidification of the surface layer, and removing the heat from the system by the reflux condensation of the vapor in the vapor space.

4,466,479

METHOD OF TRANSFERRING HEAT BETWEEN TWO FLUIDS AND HEAT EXCHANGE TUBE

John P. MacLean, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,390
Int. Cl.³ F28C *3/16*
U.S. Cl. 165—1 **5 Claims**



1. A method for efficiently transferring heat between a first fluid in a tube and a second fluid in the form of a fluidized bed around the tube comprising the steps of,

(a) moving the first fluid through an upright diamond shaped tube, and

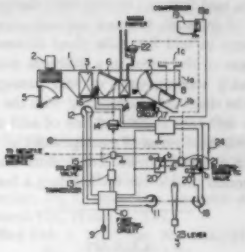
(b) moving the fluidized bed fluid therearound the upper and lower surfaces of the diamond shaped tube formed at an angle to the horizon that is greater than the angle of repose of the fluidized bed fluid for preventing accumulation of sediment from the fluidized bed fluid on top and stagnant gases on the bottom of the diamond shaped tube.

4,466,480

TEMPERATURE CONTROL APPARATUS FOR A MOTOR VEHICLE AIR CONDITIONER

Tosikazu Ito, Ibaraki, and Kenichi Chonan, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,217
Claims priority, application Japan, May 6, 1981, 56-66990
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—12 **11 Claims**



1. A temperature control apparatus for use in a motor vehicle air conditioner, the temperature control apparatus comprising:

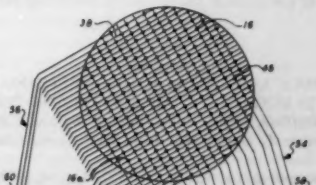
an evaporator means; a heater core means for re-heating air cooled by said evaporator means; a compressor means for circulating a refrigerant through said evaporator means; an air mixing means for controlling a ratio of an amount of cooled air passing through said heater core means for re-heating to an amount of cooled air bypassing said heater core means; a first temperature controlling circuit means for controlling a position of said air mixing means to maintain a temperature of a vehicle chamber at a desired level and for stopping said compressor means immediately prior to said evaporator means being frozen; and a second temperature controlling circuit means for controlling an operating period of time of said compressor means to maintain the vehicle chamber temperature at said desired level; and means for selectively switching said first and second temperature controlling circuit means in dependence upon operating conditions of said air conditioner.

4,466,481

LEAK DETECTING MATRIX FOR HEAT EXCHANGES

John E. Wilson, Liberty Corner, and John Polcer, Brookside, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 25, 1982, Ser. No. 352,488
Int. Cl.³ F28F *11/00*
U.S. Cl. 165—70 **14 Claims**



1. A heat exchanger for exchanging heat between separated fluids, comprising:

a plurality of heat exchange tubes, said tubes being alterna-

tively divisible into a primary plurality of mutually exclusive subsets and into an alternative plurality of mutually exclusive subsets, each one of said primary subsets sharing in common with any one of said alernative subsets at least one of said tubes; and

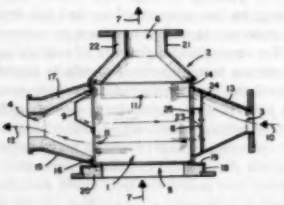
first and second tube sheets each having a plurality of tube holes, each of said heat exchange tubes being mounted between said first and second tube sheets, each end of each of said tubes being sealed into a corresponding one of said tube holes, said first and second tube sheets each having a plurality of internal, isolated passageways, each of said passageways in said first tube sheet communicating with the surfaces of the tubes in a different associated one of said primary subsets, each of said passageways in said second tube sheet communicating with the surfaces of the tubes in a different associated one of said alternative subsets, so that said isolated passageways of said first tube sheet form a coordinate reference with said passageways of said second tube sheet for locating a leak.

4,466,482

TRIPLE PASS CERAMIC HEAT RECUPERATOR

Raymond E. Dorazio, Wysox; William L. Mingos, East Smithfield, and Joseph J. Cleveland, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,415
Int. Cl.³ F28F 9/22
U.S. Cl. 165—145 **5 Claims**



1. A heat recuperator comprising a cross-flow ceramic core within a housing, the housing including an inlet conduit and an outlet conduit for a gas to be heated, the housing including means for thrice passing said gas through said ceramic core in order to improve the diffusion of said gas through said core, wherein said means includes a first insert within said inlet conduit for directing the flow of said gas through a first portion of the core and a second insert within said outlet conduit for reversing the flow of said gas through the core and redirecting said gas toward said first insert which again reverses the flow of gas through the remaining portion of the core.

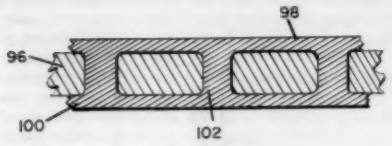
4,466,483

METHODS AND MEANS FOR CONDUCTING HEAT FROM ELECTRONIC COMPONENTS AND THE LIKE

Fred J. Whitfield, 1405 S. Village Way, Santa Ana, Calif. 92705, and Arthur T. Doyel, 4402 Casa Oro, Yorba Linda, Calif. 92686

Continuation-in-part of Ser. No. 896,177, Apr. 14, 1978, Pat. No. 4,299,715. This application Jul. 14, 1980, Ser. No. 168,551
Int. Cl.³ F28F 7/00
U.S. Cl. 165—185 **4 Claims**

2. For application to the surfaces of electronic apparatus, a heat conducting and electrically non-conducting fire retardant material in sheet form at room temperature having a central layer of plastic material filled with heat conducting elements and coated on both sides with a material which changes state between solid and a flowable state as an incident to change in temperature between normal room temperature and a temperature in the range above normal temperature and in the temperature range in which said electronic apparatus operates.

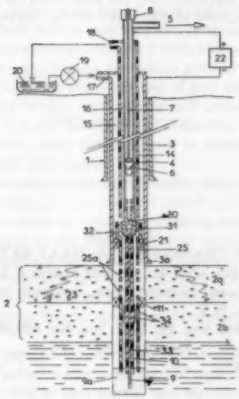


4,466,484

ELECTRICAL DEVICE FOR PROMOTING OIL RECOVERY

André J. Kermabon, Marseilles, France, assignor to Syminex (Societe Anonyme), France

Filed May 28, 1982, Ser. No. 383,166
Claims priority, application France, Jun. 5, 1981, 81 11349
Int. Cl.³ E21B 43/24
U.S. Cl. 166—60 **3 Claims**



1. Electrical device for promoting the recovery of oil contained in a reservoir formation from a production well which is completed with a metallic casing extending at least as far as the roof of said reservoir formation and with a metallic production tubing which is electrically insulated from said casing, which device comprises:

a vertical extension of said well below said formation;

an electro-conductive medium placed in said vertical extension;

a source of unidirectional voltage situated on the surface;

an electrode electrically connected to the lower end of said production tubing, the lower end of said production tubing being equipped with a non-return valve and the upper end of said electrode being electrically connected to the body of said non-return valve, said electrode being situated in said vertical extension and being covered with an insulating sheath except over several meters at the lower end contacting said electro-conductive medium;

means electrically connecting the positive terminal of said source of unidirectional voltage to the upper end of said tubing and the negative terminal of said source to the upper end of said casing and means permitting to apply the unidirectional voltage supplied by said source, in direct or pulsed manner, for predetermined periods of several days

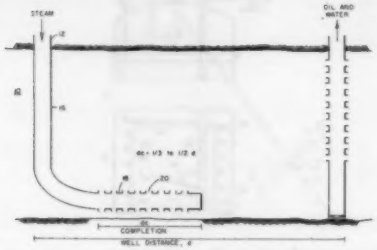
to several months alternating with off periods of several days to several months.

4,466,485

VISCOUS OIL RECOVERY METHOD

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 7, 1982, Ser. No. 447,596
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—272 **10 Claims**



1. A method of recovering viscous oil from a subterranean, low transmissibility, viscous oil-containing formation comprising:

(a) penetrating the formation with at least one injection well which extends downwardly from the earth's surface to the bottom of said formation and then extends a predetermined distance through said formation in a generally horizontal direction, said horizontal portion of said injection well being in fluid communication with said formation;

(b) penetrating the formation with at least one production well spaced apart from said injection well, said production well being in fluid communication with the upper two-thirds or less of the vertical thickness of the formation;

(c) injecting 0.35 to 0.45 pore volume of steam at an injection rate within the range of 4.5 to 6.5 bbl/day/ac.-ft. into the lower portion of the formation via said injection well and recovering fluids including oil from the formation via said production well;

(d) subsequently shutting in said injection well and continuing to recover fluids including oil from the formation via said production well for a predetermined period of time and recovering fluids including oil from the formation via the production well without steam breakthrough;

(e) injecting a predetermined amount of hot water or low quality steam into the formation via said injection well; and

(f) continuing to recover fluids including oil from the formation via said production well until the recovered fluids contain an unfavorable amount of steam or water.

4,466,486

METHOD FOR RELEASING STUCK DRILL PIPE

Clarence O. Walker, Richmond, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,786
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—301 **17 Claims**

1. An improved method for releasing a stuck drill string in a borehole of an underground formation employing an aqueous drilling fluid, the method comprising contacting the stuck drill string with an additive composition effective in dehydrating and cracking the drilling fluid or mud cake against the stuck drill string and releasing the stuck drill string, the additive composition comprising brine and a polymer selected from the group consisting of hydroxyethyl cellulose, carboxymethyl cellulose, cellulose and mixtures thereof.

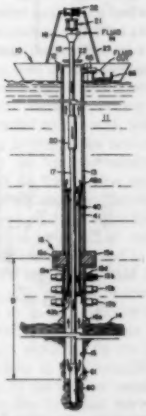
9. An improved method for releasing a stuck drill string in a borehole of an underground formation employing an aqueous drilling fluid, the method comprising contacting the stuck drill string with an additive composition effective in dehydrating and cracking the drilling fluid or mud cake against the stuck drill string and releasing the stuck drill string, the additive composition comprising water and a polymer selected from the group consisting of polyethylene oxide, ethylene oxide-propylene oxide copolymer, polyvinyl methyl ether and mixtures thereof.

4,466,487

METHOD AND APPARATUS FOR PREVENTING VERTICAL MOVEMENT OF SUBSEA DOWNHOLE TOOL STRING

Jefferson C. Taylor, Jr., Conroe, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Feb. 1, 1982, Ser. No. 344,325
Int. Cl.³ E21B *17/01*
U.S. Cl. 166—339 **12 Claims**



1. Apparatus for carrying out an operation at a desired point in a subsea borehole drilled into the marine bottom, said apparatus comprising:

a floating vessel;

blowout preventer means positioned on said marine bottom at and in communication with the upper end of said subsea borehole;

a drill string extending from said vessel, through said blowout preventer means, and into said subsea borehole;

a downhole tool carried by the lower end of said drill string; and

a vertical motion elimination means mounted for relative rotational movement on said drill string but fixed against vertical movement thereon, said means being positioned on said drill string at a point being adjacent said blowout preventer when said downhole tool lies adjacent said desired point in said subsea borehole, said vertical motion elimination means being adapted to be engaged by said blowout preventer means when said blowout preventer means is activated to fix said downhole tool against vertical motion within said borehole, while allowing circulation of fluid from said vessel through said drill string and back to said vessel through said vertical motion elimination means.

4,466,488

POSITION INDICATOR FOR DRILL STRING COMPENSATOR

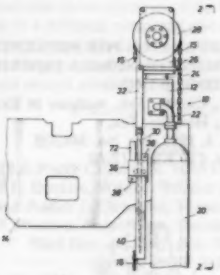
Douglas W. J. Nayler; Gerald W. Gilson; Fred C. Tilker, and James W. Albert, all of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

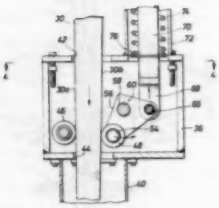
Filed Nov. 19, 1981, Ser. No. 322,728

Claims priority, application United Kingdom, Dec. 22, 1980, 8041045

Int. Cl.³ E21B *19/09*

U.S. Cl. 166—355 **22 Claims**





1. Motion compensation apparatus for disposition between an offshore support structure and an offshore well structure movable with respect to said support structure, comprising:

first and second compensator bodies interconnected with said support structure and said well structure, and further interconnected with each other, such that relative movement between said structures causes relative movement between said compensator bodies;

and position indicator means associated with said bodies comprising

first and second indicator members carried respectively by said first and second compensator bodies whereby said relative movement of said compensator bodies causes relative movement of said indicator members in a first directional mode;

said first indicator member being elongated in said first directional mode and having a transverse dimension which varies along its length;

said second indicator member being laterally engagable with said first indicator member and further being laterally movable with respect to said first indicator member;

and means operably associated with said second indicator member for producing a signal varying with the lateral movements of said second indicator member.

4,466,489

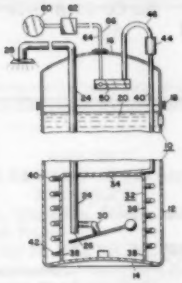
SELF-CONTAINED FIRE PROTECTION APPARATUS

John T. M. Lee, Phoenixville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Mar. 3, 1982, Ser. No. 354,223

Int. Cl.³ A62C *13/40*

U.S. Cl. 169—26 **2 Claims**



1. Apparatus for dispensing a liquid in an emergency, said apparatus comprising:

(a) a container which is normally under substantially atmospheric pressure for containing a first liquid to be dispensed, said container having an outlet for discharging said liquid from said container when said container is pressurized;

(b) one or more tubes for containing a volatile propellant in liquid form under pressure, each of said tubes being open at one end and closed at the other end, said tube(s) having a high ratio of wall surface to volume so as to provide a substantial wall surface area for heat transfer;

(c) means providing for heat transfer via indirect heat exchange from a flowing stream of said first liquid to said propellant during dispensing of said first liquid;

(d) a normally closed passageway connecting the open end(s) of said tube(s) with the interior space of said container; and

(e) means operable from outside said container and responsive to an abnormal condition at a protected location for opening said passageway to permit propellant vapors to flow from said tube(s) to said container, thereby pressurizing said container and causing said first liquid to be dispensed.

4,466,490

HYDRAULIC WEEDER

Robert E. Eckels, 49 S. Lookout Mountain Rd., Golden, Colo. 80401

Filed Sep. 24, 1982, Ser. No. 423,406

Int. Cl.³ A01B *1/16*

U.S. Cl. 171—50 **10 Claims**

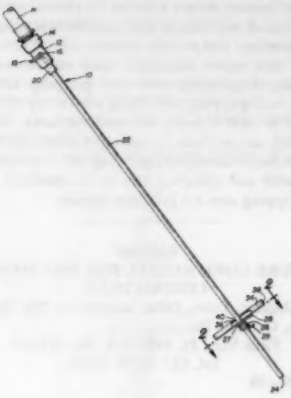
1. A hydraulic weeding apparatus for completely removing undesirable weeds from the soil, the apparatus comprising:

(a) an elongated hollow member having a means at one end for attaching to a source of pressurized fluid, the other end being left open to allow the fluid to freely flow from the member;

(b) a gripping means spaced from said open end and having an outwardly extending hook member arranged to encircle and grip the root of said weed so that the weed can be removed once the root has been loosened by the flow of the fluid; and

(c) said gripping means is formed from a resilient wire which is tightly wrapped around the outside surface of said elongated member and having outwardly extending free ends, with at least one free end of the wire being shaped to form said hook member, the free ends of said gripping

means are arranged so that they can be squeezed toward each other so that the gripping means can be loosened and



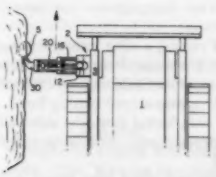
positionally adjusted along said elongated hollow member depending upon the type of weed intended to be removed.

4,466,491

APPARATUS FOR REMOVING ROCKS AND OBJECTS

Douglass G. Tower, 724 Somerset Ave., Princess Anne, Md. 21853

Filed Jun. 30, 1982, Ser. No. 393,614
Int. Cl.³ E02F *3/76, 5/30*; A01B *63/106, 63/118*
U.S. Cl. 172—459 **9 Claims**



1. A ripper apparatus comprising a main upright support bracket adapted to be secured to a vehicle,

a first arm means pivotally mounted at a first end thereof to said bracket for pivotal movement about a first axis,

a second arm means mounted to a second end of said first arm means for pivotal movement about a second axis substantially parallel to said first axis,

first power means positioned between said bracket and said first arm means for rotationally positioning said first arm means about said first axis,

second power means connected between said first and second arm means for rotationally positioning said second arm means about said second axis, and

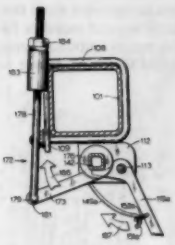
ripper shank means for engaging and removing embedded objects and extending from said second arm means generally perpendicular to said second arm means, said first and second power means being selectively operable to position said shank in a range of positions in a plane transverse to said first axis.

4,466,492

EARTHWORKING IMPLEMENT HAVING SPRING BIASED ARMS

Richard W. Steinberg, North Mankato, Minn., assignor to Hiniker Company, Mankato, Minn.

Filed Nov. 9, 1981, Ser. No. 319,185
Int. Cl.³ A01B *39/08*
U.S. Cl. 172—551 **31 Claims**



1. An earthworking implement comprising: a tool bar, means for connecting the tool bar to a tractor, first support means connected to the tool bar, said first support including a rod extended generally parallel to the tool bar, means mounting the rod on the tool bar, first and second arms pivotally mounted on the rod for independent movement in a generally upright direction, earthworking tool means mounted on each arm for working the soil; second support means connected to the tool bar, said second support means including a torsion member extended generally parallel to the rod, said means mounting the rod on the tool bar having holes accommodating the torsion member whereby the torsion member can be rotated, biasing means mounted on the torsion member, said biasing means comprising a spring assembly having a first coil body having opposite ends, a second coil body having opposite ends, a neck section connected to adjacent ends of the first and second coil bodies, a first member joined to an end opposite the adjacent end of the first coil body, said first member being connected to the first arm pivotally mounted on the rod, a second member joined to an end opposite the adjacent end of the second coil body, said second member being connected to the second arm pivotally mounted on the rod, means engageable with the neck section to non-rotatably connect the first and second coil bodies to the torsion member, and means for rotating the torsion member to adjust the biasing forces of the biasing means on the first and second arms and holding the torsion member in an adjusted position whereby the biasing forces on said first and second arms are maintained.

4,466,493

RECIPROCATING LINEAR FLUID MOTOR

Maurice Wohlwend, Seattle, Wash., assignor to HED Corporation, Issaquah, Wash.

Filed Dec. 17, 1981, Ser. No. 331,650
Int. Cl.³ E21C *3/04*
U.S. Cl. 173—19 **28 Claims**

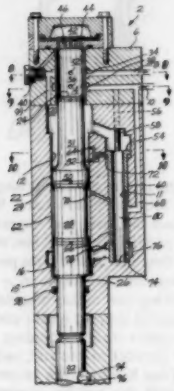
1. A linear reciprocating motor comprising:

a housing including a longitudinal cavity;

an elongated member including an upper end confined in the longitudinal cavity and having an upper position and a lower position;

first drive means exerting a force on said upper end tending to forcibly move the elongated member endwise through the longitudinal cavity towrard its lower position; said first drive means including an expansible fluid chamber formed by one end of the longitudinal cavity adjacent to the upper end of the elongated member, and spring means in pressure communication with the fluid chamber, said spring means being compressed when pressure is applied to an incompressible hydraulic fluid in the fluid chamber;

second drive means for forcibly moving the elongated member endwise through the longitudinal cavity toward its upper position in opposition to the force of the first drive means; said second drive means including regulating means for alternating the second drive means between a first mode in which the second drive means exerts a force on the elongated member for moving said upper end against the first drive means and compressing the spring means, and a second mode in which the force of the second drive means is removed from the elongated member, resulting in the elongated member being forcibly moved by the first drive means endwise thorough the longitudinal cavity toward said member's lower position; and



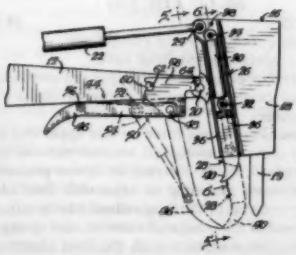
limit means for diverting the force of the first drive means away from the elongated member before said member reaches its lower position, so that the elongated member free travels before coming to a stop in its lower position and reversing its direction of movement; said limit means comprising a fluid outlet, and passageway means which, when open, communicates the fluid chamber with the fluid outlet and which closes in response to movement of the elongated member toward its upper position and opens in response to movement of said member toward its lower position.

4,466,494

IMPLEMENT WITH GRIPPING ARM ASSEMBLY FOR A BACKHOE

Charles B. Hanson, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 25, 1982, Ser. No. 411,544
Int. Cl.³ E21C *37/00*
U.S. Cl. 173—46 **3 Claims**



1. An improved arrangement for gripping objects adapted for use with an excavator having a dipper arm, including a selectively movable clamping arm mounted on said dipper arm, comprising:

hydraulic hammer means adapted for pivotal support on the distal end of said dipper arm, said hammer means including a housing; and

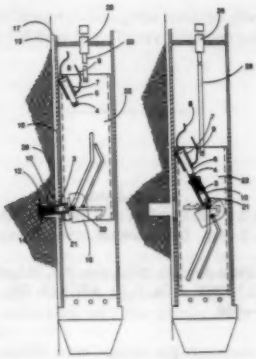
gripping arm means associated with said hammer means, including a gripping arm and gripping arm actuator means, said gripping arm being selectively movable with respect to said housing between retracted, non-use and extended, use positions by selective actuation of said actuator means, whereby said gripping arm is adapted to cooperate with said clamping arm in the extended position of said gripping arm for gripping objects.

4,466,495

PRESSURE CORE BARREL FOR THE SIDEWALL CORING TOOL

Alfred H. Jageler, Tulsa, Okla., assignor to The Standard Oil Company, Chicago, Ill.

Filed Mar. 31, 1983, Ser. No. 481,091
Int. Cl.³ E21B *49/06*
U.S. Cl. 175—59 **10 Claims**



1. A method of cutting a core from a sidewall of a borehole and retaining it in a pressured condition comprising:

cutting a core from said sidewall by extending and rotating a core barrel having a core cutting head;

retracting said core barrel from the sidewall;

rotating said retracted core containing core barrel to a tilted position, and

sealing said retracted tilted core barrel with said cut core therein.

4,466,496

TECHNIQUE FOR DAMPING OSCILLATIONS IN A DRILL STRING

Kenneth R. Jones, Corpus Christi, Tex., assignor to Mustang Trip saver, Inc., Corpus Christi, Tex.

Continuation of Ser. No. 57,848, Jul. 16, 1979, abandoned, which is a continuation of Ser. No. 950,057, Nov. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,719, Nov. 8, 1977, abandoned. This application Sep. 8, 1980, Ser. No. 184,678
The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.
Int. Cl.³ E21B *17/07*
U.S. Cl. 175—67 **4 Claims**

1. A shock sub for connection in a drill string, comprising

a barrel having means at one end for connection to the drill string;

a mandrel mounted in the barrel for telescoping movement along a longitudinal axis, having means at one end for

connection to the drill string and defining, with the barrel, a vertically extending annular spring receiving chamber;

means for transmitting torque between the barrel and mandrel;

a ring spring assembly in the chamber for damping relative movement of the mandrel and barrel, the assembly comprising

a multiplicity of inner and outer annular ring springs residing in planes transverse to the axis,

the inner ring springs comprising radially outer surfaces inclined to the axis,

the outer ring springs comprising radially inner surfaces

inclined to the axis and engaging the radially outer surfaces of the inner ring springs for providing a metal-to-metal seal dividing the ring receiving chamber into radially inner and radially outer chamber segments;

the assembly exhibiting a substantially constant spring rate of less than 25,000 pounds per inch of deflection and a load capacity of between 10,000–125,000 pounds;

means carried by the mandrel and barrel for expanding the outer ring springs and compressing the inner ring springs upon collapsing movement of the mandrel and barrel;

a lubricant in the chamber; and

means providing communication between the radially inner and radially outer chamber segments.

4,466,497

WIRELINE CORE BARREL

Alexander F. Soinski, 1228 Hermosa St.; Frederick J. Soinski, 2810 Orchard Ave., and William R. Soinski, 620 Oxbow Rd., all of Grand Junction, Colo. 81501

Filed Mar. 19, 1982, Ser. No. 359,826

Int. Cl.³ E21B *25/02*

U.S. Cl. 175—246 **7 Claims**

6. A core barrel for retrieving a core within a substantially cylindrically shaped, tubular, core drilling string, said core barrel comprising:

an elongate, generally cylindrically shaped body having a fluted periphery comprising at least two longitudinal ribs and channels, said elongate body adapted to be disposed within the drill string such that the channels thereof are oriented substantially parallel to the axis of the drill string, whereby when said elongate body is disposed within the drill string and a fluid flows within the drill string, the fluid may flow around the periphery of said elongate body, through the channels thereof;

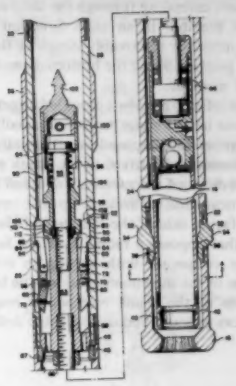
a longitudinal slot in at least one rib;

a cross bar extending across the longitudinal slot, above the bottom wall of the slot, and separating the longitudinal slot into an upper section and a lower section;

a first bar at least partially disposed within the lower slot section, connected to, and laterally extensible with respect to, said elongate body, and adapted for engagement with the interior wall of the drill string;

means for resiliently urging said first bar laterally outward with respect to said elongate body;

a second bar at least partially disposed within the upper slot section, connected to, and laterally extensible with respect



to, said elongate body, and adapted for engagement with the interior wall of the drill string;

means for resiliently urging said second bar laterally outward with respect to said elongate body;

said elongate body being provided with at least one longitudinal hole in the rib in which the slot is located, the hole providing a means for fluid communication between the slot and the longitudinal ends of said elongate member.

4,466,498

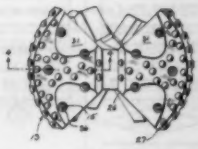
DETACHABLE SHOE PLATES FOR LARGE DIAMETER DRILL BITS

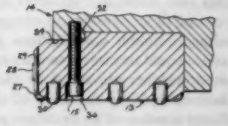
Allen E. Bardwell, P.O. Box 507, High Knob Estates, Front Royal, Va. 22630

Filed Sep. 24, 1982, Ser. No. 422,586

Int. Cl.³ E21B *10/20*

U.S. Cl. 175—410 **10 Claims**





1. An improved drill bit for gravity-drop cable drilling, the bit comprising:

an elongated shank member having a bottom diametrical portion;

a shoe member with a metal shoe body and with inserts of a metal that is harder than the metal of the shoe body, some of the inserts projecting at an angle from a bottom of a toe on the shoe body, these angularly projecting inserts being operable to cut along an outer edge of a hole being drilled;

fastener means extending through the shoe member and into the shank member in an axial direction relative to the shank member for removably coupling the shoe member in a fixed position along the bottom diametrical portion of the shank member;

wherein one of the members coupled together by the fastener means has a tongue projecting axially relative to the shank member and disposed longitudinally relative to the bottom diametrical portion of the shank member; and

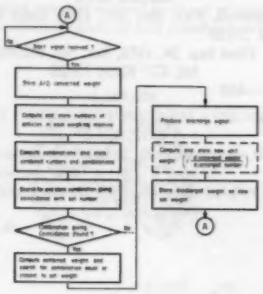
wherein the other of the members coupled together by the fastener means has an arcuate lip that opposes a radially outward facing side of the tongue and also has a projecting stop that opposes a radially inward facing side of the tongue to cooperate with the lip in restraining radial movement of the shoe member along the bottom diametrical portion of the shank member in response to radial shear forces encountered during cable drilling operations.

4,466,499

COMBINATORIAL COUNTING METHOD

Kazukiyo Minamida, Shiga, and Kouichi Ohta, Chiba, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 20, 1982, Ser. No. 419,924
Claims priority, application Japan, Sep. 22, 1981, 56-149754
Int. Cl.³ G01G *9/00, 19/22, 19/00*
U.S. Cl. 177—1 **10 Claims**



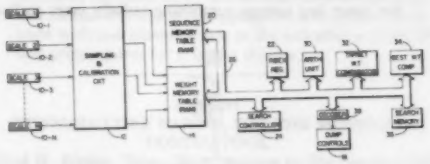
1. A combinatorial counting method for weighing a multiplicity of articles by one or a plurality of weighing machines, dividing the resulting plurality of weights by a unit weight to convert the weights into respective numbers of the articles, finding combinations of these numbers to compute combined numbers, and finding optimum combinations of which the combined numbers are equal or closest to a set number and of which the combined weights are equal or closest to a set weight, said method comprising the steps of discriminating whether the combined number of an optimum combination is equal to the set number and, when equality is discriminated, employing the combined weight of said optimum combination as the set weight in the next combinatorial counting operation.

4,466,500

COMBINATION WEIGHING SYSTEM

Oren A. Mosher; Oren G. Mosher, both of Hayward, and Ellwood S. Douglas, Orinda, all of Calif., assignors to Package Machinery Company, Oakland, Calif.

Filed Sep. 30, 1982, Ser. No. 430,354
Int. Cl.³ G01G *7/00, 19/22, 19/413*
U.S. Cl. 177—1 **20 Claims**



1. A combination weighing system to search for and obtain a minimum qualified weight of product not less than a target weight from among multiple quantities of the product comprising:

a plurality of weighing scales, each receiving and weighing a quantity of the product and providing a weight signal representative of the weight of the product in the scale;

arithmetic means connected with the plurality of scales to receive the weight signals for determining the combined weight of the product in selected combinations of the scales during a search operation;

first means for comparing the combination weights with a target weight to identify qualified combination weights at and above the target weight;

second means for comparing qualified combination weights with the other qualified combination weights to establish the minimum qualified weight and corresponding combination of scales;

memory means for storing the best minimum qualified weight and corresponding combination; and

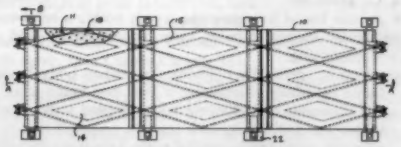
search control means for controlling the search of various combination of scales in an ordered search sequence and including means for omitting from the sequence a combination of scales having a subcombination previously searched and found to be qualified.

4,466,501

VEHICLE WEIGHING DEVICE

Michael J. Karpa, 45 E. Bend Ave. N., Hamilton, Ontario, Canada L8L 7E1

Filed May 10, 1982, Ser. No. 376,714
Claims priority, application Canada, Sep. 29, 1981, 386913
Int. Cl.³ G01G *19/02*
U.S. Cl. 177—134 **6 Claims**



1. A vehicular weighing device comprising:

a. a plurality of longitudinally arranged concrete panels prestressed in longitudinal and lateral direction,

b. said panels having a plurality of continuous, longitudinal prestressing cables therethrough connecting said panels and causing said panels to be prestressed in a longitudinal direction,

c. a pivot means at the juncture of said panels allowing rotational movement of the panels at said juncture, and

d. said panels mounted on a plurality of load cells for determining the weight of an object placed upon said panels.

4,466,502

SYSTEM FOR CONTROLLING TRANSMISSION TORQUE OF A FOUR-WHEEL DRIVE VEHICLE

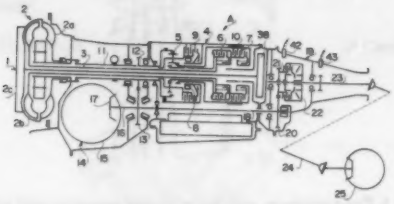
Yasuhito Sakai, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,654

Claims priority, application Japan, Sep. 29, 1981, 56-155854

Int. Cl.³ B60K *17/34*

U.S. Cl. 180—247 **4 Claims**



1. A system for controlling a transmission torque of a four-wheel drive vehicle powered by an engine comprising:

a transmission for operatively transmitting a power of said engine to front wheels;

a friction clutch for transmitting said power to rear wheels;

clutch operating means for engaging and disengaging said friction clutch, said clutch operating means comprising a first means for providing a partial engagement of the clutch, a second means for providing an engagement greater than said partial engagement, and a third means for disengaging said clutch;

slip detecting means for detecting the slipping of wheels;

load detecting means for detecting the load on said engine;

control means responsive to signals from said slip detecting means and load detecting means for operating said second means so as to engage said clutch at heavy load and at the slipping of wheels.

4,466,503

BEARING ASSEMBLY FOR THE DRIVEN WHEEL OF A VEHICLE

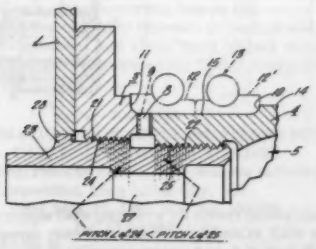
Rüdiger Hans, Niederwerrn, and Roland Haas, Lendershausen, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,130

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138366

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—259 **6 Claims**



1. A hub bearing assembly for the wheel of a motor vehicle comprising a wheel flange having means for mounting the wheel of the vehicle thereto and a drive joint including a sleeve member, a rolling bearing assembly mounted on the outer periphery of the sleeve member, said wheel flange and sleeve member having confronting interengaging means, said wheel flange having a threaded central bore of a pitch differing from the pitch of a threaded bore of said sleeve member and a threaded bolt with differential thread portions engageable in the aligned threaded bores of said wheel flange and sleeve member to permit axial adjustment of said wheel flange and sleeve member and engagement or disengagement of said interengaging means.

4,466,504

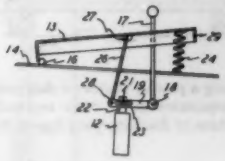
TRACTOR SEAT-OPERATED HYDRAULIC VALVE CONTROL

Frank J. Giandenoto, Racine, and Anthony J. Salis, Milwaukee, both of Wis., assignors to Textron Inc., Providence, R.I.

Filed Feb. 3, 1983, Ser. No. 463,403

Int. Cl.³ B60K *25/00*

U.S. Cl. 180—273 **10 Claims**



1. A tractor seat-operated hydraulic valve control, comprising a powered tractor, a hydraulically powered implement connected with said tractor, a hydraulic valve and a hydraulic motor operatively interconnected and operatively connected with said implement for powering said implement, said hydraulic valve having a neutral position where no fluid is passed to said hydraulic motor, a manual control mounted on said tractor and operatively connected with said hydraulic valve for controlling the flow of fluid through said valve and to said hydraulic motor, said manual control including a pivotally mounted member interconnected with said valve for operating said valve, including setting said valve in said neutral position, an uprightly disposed and vertically movable member having its lower end interconnected with said pivotally mounted member for positioning said pivotally mounted member in said neutral position, when said vertically movable member is in an upward position, a vertically movable operator's seat on said tractor, a spring on said tractor and operative on said seat for moving said seat to an upward position in the absence of the weight of the operator on said seat, and said vertically movable member being connected with said operator's seat and being movable to said upward position along with said seat for positioning said pivotally mounted member in said neutral position.

4,466,505

SOUND REPRODUCING COMBINATION

David Ritter, Aston, Pa., assignor to Temporal Dynamics Research, Inc., Aston, Pa.

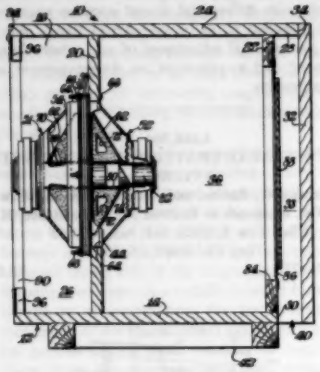
Filed Apr. 19, 1982, Ser. No. 369,825

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—144 **11 Claims**

1. A woofer sound generating apparatus for delivering sounds having frequencies down to below 30 hertz, said apparatus having a box whose height, width and depth are each between about 15 and 21 inches, the interior of the box housing a pair of woofer loudspeakers corresponding to each other in size, each having a dynamically driven speaker cone held by the face of a supporting frame, the frame faces being clamped to each other in face-to-face relation, the cones being mechanically linked together and the speakers being interconnected so that they are dynamically driven in oppositely phased relation,

the cone frames having side windows that pass sound generated by the cones, the speaker frames being mounted so that the cone of one frame radiates sound directly out one side of the box, and the box also having on a different side a baffled



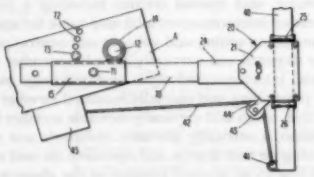
outlet containing a passive resonator that preferentially passes the lowest frequencies to an outer vertically directed duct open at its bottom to discharge said lowest frequencies downwardly.

4,466,506

WIRE LIFT DEVICE FOR HIGH TENSION ELECTRIC LINE

Alfred N. Dolenti, 192 Limerick Center Rd., Royersford, Pa. 19468

Filed Jan. 15, 1982, Ser. No. 339,661
Int. Cl.³ B66F *11/04*
U.S. Cl. 182—2 **3 Claims**



1. A wire lifting device adapted for attachment to an electric lineman's boom truck intended for use in lifting simultaneously at least two energized high tension line wires above a work area for clearing the work area thereunder, said lifting device comprising:

a. a jib arm attached to the boom and extending forwardingly thereof,

b. a sleeve;

c. means for mounting said sleeve on the forward end of said jib arm with the axis of said sleeve vertical relative to said jib arm;

d. an elongated mast slidingly received within said sleeve;

e. a temporary crossarm for temporarily supporting at least two energized high tension conductors in horizontal positions relative to each other;

f. means connecting said temporary crossarm to the upper end of said mast; and

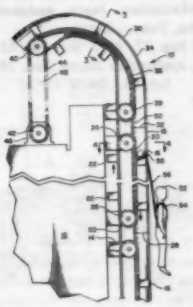
g. power means for lifting said mast to cause said temporary crossarm to lift and support at least two energized high tension conductors above the work area.

4,466,507

EMERGENCY ESCAPE APPARATUS

Frank Itano, 203 Clinton St., Yuba City, Calif. 95991

Filed Jun. 16, 1983, Ser. No. 504,952
Int. Cl.³ A62B *1/00*
U.S. Cl. 182—3 **23 Claims**



1. For a structure, emergency escape apparatus used with an occupant harness, comprising:

at least one vertically extending hollow member having a top and bottom, said hollow member having a vertically extending opening provided therein;

mounting means for securing said hollow member to said structure;

engagement means disposed in said hollow member and vertically movable therein, said engagement means engageable and disengageable respectively with said occupant harness at said top and bottom of said hollow member, said occupant harness extendable from said engagement means through said opening to said harness;

mover means at least partially disposed in said hollow member having said engagement means connected thereto to move said engagement means in said hollow member; and

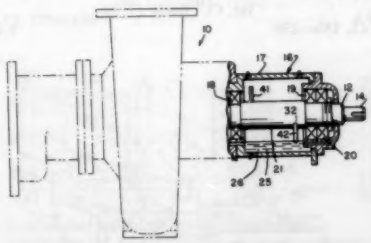
driver means connected to said mover means to control the speed of movement of said movement means and said engagement means in said hollow member.

4,466,508

LUBRICATION DEVICE

Frederick W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 26, 1982, Ser. No. 444,847
Int. Cl.³ F01M *9/06*
U.S. Cl. 184—13.1 **4 Claims**



1. A lubrication system for a rotating shaft support assembly having a shaft extending between two ends supported by a bearing at each end, said system comprising:

an oil sump positioned below the shaft support assembly having oil stored to a selected level below the shaft,

a first hole and a second hole in the shaft, said holes each at

a selected distance from a respective bearing and extending part way into the shaft and having a depth and width adapted to receive and retain a pin, and

a pin inserted into each hole having a length selected to extend below the oil sump level during a selected portion of rotation of the shaft.

4,466,509

ELEVATING DEVICE

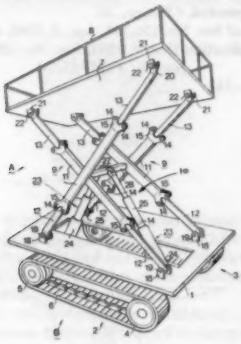
Mitsuhiro Kishi, 1320 Mizuhonocho, Ashikaga-shi, Tochigi-Pref., 326-03, Japan

Filed Mar. 18, 1982, Ser. No. 359,541

Claims priority, application Japan, Mar. 20, 1981, 56-41289; Jun. 27, 1981, 56-99947; Jun. 27, 1981, 56-99948; Aug. 26, 1981, 56-134487

Int. Cl.³ B66B *11/04*

U.S. Cl. 187—18 **14 Claims**



1. An elevating apparatus comprising

a vehicle body,

a lift,

at least one supporting beam assembly for moving said lift up and down on said vehicle body,

said supporting beam assembly including

a pair of middle supporting beams having a common pivot in a manner to be angularly movable into an X-shape,

a pair of lower supporting beams slidably supported in said middle supporting beams, respectively, and

a pair of upper supporting beams slidably supported in said middle supporting beams, respectively,

means for cooperating with said lower and upper supporting beams to drive the lower and upper supporting beams in opposite directions,

means for controlling operation of said at least one supporting beam assembly to move said lift up and down,

said cooperating means comprising a chain having one end connected to an upper end of each of said lower supporting beam and an opposite end connected to a lower end of each of said upper supporting beams, and

a sprocket wheel rotatably mounted on each of said middle supporting beams, said chain being trained around said sprocket wheel in a substantially folded configuration.

4,466,510

AUTOMATIC FLOOR-LEVELING MEANS FOR A CABLE-SUSPENDED ELEVATOR

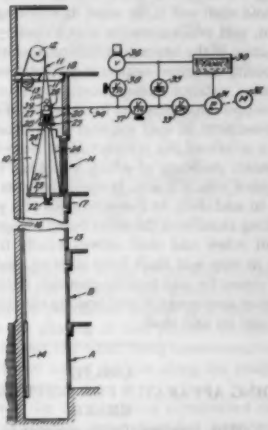
Fred N. Sollog, Franklin Square, N.Y., assignor to Staley Development Corporation, Long Island City, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,488

Int. Cl.³ B66B *1/40*

U.S. Cl. 187—29 R **6 Claims**

1. In an elevator system for a multi-level structure (a) wherein an elevator cage having an upper transverse beam is cable-suspended via a hitch plate under said beam and is counterweighted over a drive sheave, (b) wherein a car is fixedly carried by and within said cage, and (c) wherein motor drive to the sheave includes a control to determine a stopping of the elevator cage at a particular floor, the improvement in which an automatic floor-leveling mechanism comprises: a hydraulic jack including a cylinder body fixed to said upper beam and including a jack-movable plunger element by which the cage is cable-suspended via downwardly reacting abutment with the hitch plate; a hydraulic circuit including a reservoir, a pump



with inlet connection to said reservoir and outlet connection to said cylinder, and a bleed connection from said cylinder to said reservoir; and jack-operated feedback-control means including a control valve in said bleed connection, said feedback-control means also including a floor-level actuated probe, said probe being operative to sense a difference between level of the elevator-car floor and the level of the particular structure floor at which the elevator cage has been controlled to stop, and the sensed difference being operative to correctively operate said jack until reduction of said difference to substantially zero.

4,466,511

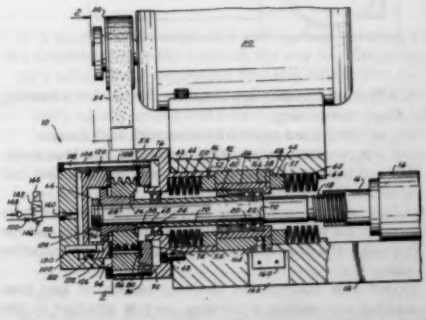
LEAD SCREW OVERTHRUST PROTECTION

Donald W. Garnett, Grand Ledge, Mich., assignor to The Olofsson Corporation, Lansing, Mich.

Filed Jul. 27, 1981, Ser. No. 287,360

Int. Cl.³ B60T *7/12*

U.S. Cl. 188—134 **10 Claims**



1. In apparatus having a movable member, a drive including a rotatable shaft threaded to said member and operative to move said member when rotated, power means for rotating

said shaft, mechanism for protecting the apparatus from damage due to excessive overloads when movement of said member is obstructed, said mechanism comprising means supporting said shaft for axial movement, resilient means locating said shaft axially in operative position and preventing axial movement of said shaft in both directions from said operative position under ordinary operating conditions when movement of said member is not obstructed and said shaft is subjected to axial loading below that which is excessive, said resilient means including a first spring means acting axially in one direction against said shaft and in the same direction against a first fixed abutment, said resilient means also including a second spring means acting in the opposite direction against said shaft and in said opposite direction against a second fixed abutment, said shaft during rotation being caused to move axially from its operative position against the force of one of said spring means when movement of said member is obstructed to create an excessive overload but without assist from the other of said spring means the force of which is blocked by the fixed abutment against which it acts, braking elements spaced axially in relation to said shaft on opposite sides of a part on said shaft, one braking element or the other being engaged by said part on said shaft when said shaft moves axially from its operative position to stop said shaft from rotating, and yieldable brake support means for said braking elements resisting with a yielding pressure movement of said braking elements when engaged by said part on said shaft.

4,466,512

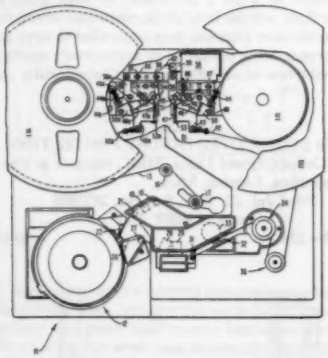
LOADING APPARATUS FOR DIFFERENTIAL BAND BRAKE

William F. Witt, Oakland, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,826

Int. Cl.³ B60T *13/04*

U.S. Cl. 188—171 **4 Claims**



1. A differential loading apparatus for the band of a rotating brake drum, comprising:

a base member fixed against rotation with said drum;

a first arm mounted for pivoting motion on said base member, and having a pivoting portion attached to a first end of said brake band;

said first arm having a spring loaded coupling to said base member for tensioning the band around the drum and for opposing the forward rotation thereof in cooperation with:

a second arm mounted for pivoting motion on said base member and having a pivoting portion attached to the other end of said brake band;

said second arm having a springloaded coupling to said base member for tensioning the band around the drum and for opposing the reverse rotation thereof in cooperation with said first springloaded arm;

said first and second arms being adapted to apply different tensioning forces to said band, so that said band applies differential braking forces to said drum depending on the direction of drum rotation; and

solenoid means and linkage means coupled between said solenoid means and one of said arms for relieving at least one end of said band upon energization of said solenoid to permit said drum to rotate, said linkage means being springloaded to free at least one arm upon de-energization of said solenoid means to ensure prompt braking of said drum.

4,466,513

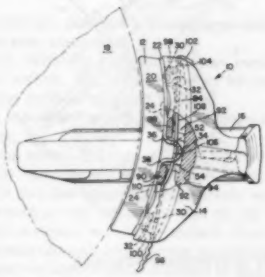
RAILROAD BRAKE SHOE-BRAKE BEAM ASSEMBLY

Tomasz W. Dedek, Wheaton, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation of Ser. No. 136,798, Apr. 3, 1980, abandoned. This application Dec. 9, 1981, Ser. No. 328,903

Int. Cl.³ F16D *65/04*

U.S. Cl. 188—243 **3 Claims**



1. A railroad brake shoe for use with a braking system of a railroad vehicle, said brake shoe comprising, a friction element, unitary plate means connected to said friction element to provide support thereto, said unitary plate means having an attaching means projecting outwardly from said plate means on a side opposite said friction element, said attaching means including a pair of lengthwise spaced upstanding members located substantially mid-way of said unitary plate means, each of said upstanding members having a window including an upper wall inclined at an acute angle, each said wall being inclined in opposing relationship to provide a pair of downwardly facing opposing edges, a key extending through said opening and being bowed so that the upper surface contacts and grippingly engages in substantially linear contact said downwardly facing window wall edges to thereby resist lengthwise movement of said key relative to said brake shoe.

4,466,514

CYLINDER-PISTON DEVICE

Werner Mölders, Plaidt; Herbert Freitag, Koblenz-Metternich, both of Fed. Rep. of Germany, and Lawther O. Smith, Doylestown, Pa., assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,792

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950888

Int. Cl.³ F16F *9/19*

U.S. Cl. 188—320 **16 Claims**

1. In a cylinder-piston device, comprising:

a cylinder having an axis and two end walls;

a cavity defined within said cylinder;

an axially movable piston rod extending inward and outward

of said cavity through an aperture in at least one of said end walls;

a piston unit within said cavity and operatively connected to said piston rod, said piston unit defining first and second working chambers within said cavity and including a piston member;

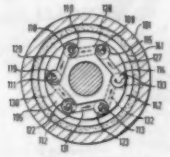
a fluid within said cavity; and

at least one passage-defining means extending through said piston unit and connecting said first and second working chambers during at least part of the stroke of said piston unit with respect to said cylinder, the improvement in said piston unit wherein:

said passage-defining means includes means defining a substantially meander-shaped sequence of passage sections extending over at least part of the length of said passage;

said piston member has two axially directed end faces, each of said end faces lying in a plane substantially perpendicular to the axis of said cylinder;

said meander-shaped sequence of passage sections being



defined by corresponding first and second sequences of channel sections, extending in a substantially circumferential direction around said axis of said cylinder, provided in each axially directed end face of the piston member of said piston unit;

said first and second sequence of channel sections each including means at one end thereof defining an opening to said first and second working chambers, respectively, said means at one end each comprising two adjacent radial passages, each radial passage having a cross sectional area less than the cross sectional area of said first and second sequences of channel sections, said first sequence of channel sections and said second sequence of channel sections being connected by at least one axial bore at a location remote from said one end thereof which at least one axial bore extends completely across the piston member of said piston unit; and

first and second cover plates overlying each of said end faces and covering in a fluid-tight manner said respective first and second channel sections.

4,466,515

INVESTMENT GAME BOARD AND APPARATUS

Joseph R. D'Aurora, and David F. Specht, both of 5936 Stumph Rd., Apt. 319, Parma, Ohio 44130

Filed Nov. 3, 1981, Ser. No. 317,915

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—256 **21 Claims**

14. An investment game comprising:

(a) a playing board including a player token advancement path divided into a plurality of spaces;

(b) an information board including indicia and being movably connected to the playing board;

(c) player tokens each of which has a different visual appearance than the other tokens;

(d) certain of the playing board spaces being a business set representative of businesses in which players may invest, at least some of the spaces in the business set being apertured;

(e) certain other of the spaces forming an economic condition set each representative of an economic condition different than at least some of the conditions of the remaining spaces of the set;

(f) indexing means for relatively moving the boards to align selected and appropriate indicia which apertures of the business set spaces whenever a player's token lands on one such economic condition space of an economic condition different than that then prevailing, such relative movement resulting in a change of economic condition for the entire board and all players;

(g) a random number generating means for determining the number of spaces each player's token will be advanced each player turn;

(h) a plurality of groups of board mountable devices coded differently from one another, one group of devices per player, a player's purchased interest in a business being indicated by the placing of that players device on that business space; and, the board being constructed to accept a plurality of said coded devices along the periphery of said business spaces

(i) the board and the devices being constructed such that together they delineate the total number of business interest which may be purchased in a given business.

4,466,516

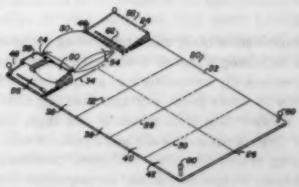
MULTI-PURPOSE SUNBLANKET AND TOTE BAG

Robert Sicoli; Frank Sicoli, and Eugene Sicoli, all of Belleville, N.J., assignors to RVS Enterprises, Belleville, N.J.

Filed Jun. 6, 1983, Ser. No. 501,430

Int. Cl.³ A45G *9/00*

U.S. Cl. 190—2 **5 Claims**



1. A multi-purpose sunblanket and tote bag including a mat of a foldable blanket-like material, the tote bag comprising:

(a) a substantially rectangular first area having a major axis and a minor axis, said mat defining at least four substantially equally spaced fold lines disposed transversely to the major axis of the mat, said fold lines defining four sub-rectangles each having areas substantially equal to each other, said sub-rectangles having their major axis disposed transversely to the major axis of the said foldable mat whereby each of said four rectangles may thereby be readily folded upon and in each other such that said first area thereby forms a single fold portion having substantially the area and shape of a single one of said sub-rectangles;

(b) a second area integral to said first area and separate therefrom by one of said spaced fold lines, said second area defining a sub-rectangle of substantially the same area and shape of said four sub-rectangles of said first area, said

second area thereby being foldable upon and against the sub-rectangle of said first area when said first area is fully folded along said fold lines, said second area further defining two internal fold lines to thereby form three sub-subrectangles that are mutually foldable onto each other and, as well, onto the folded sub-subrectangles of said first area, thereby permitting the folding of said sub-rectangles of the first area into substantially the same area and shape of the sub-rectangles of said second area, in which said three sub-subrectangles of said second area further comprises a pillow integrally disposed upon one of said sub-subrectangles, pocket means including closing structure, integrally disposed upon said second and third sub-subrectangles of the second area;

(c) means for securing said first and second areas to each other and in a closed condition after said first and second area have been folded into their sub-subrectangular configuration;

(d) means for carrying the completely folded multipurpose tote bag about the shoulder of the user; and

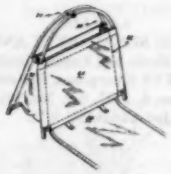
(e) means for securing said mat, when unfolded, to an earth-like horizontal surface, whereby a variety of beach related and personal care items can be disposed within the pockets, and enclosures of said multi-purpose tote bag and, in an unfolded condition, can be used as a beach blanket readily securable to the ground or beach.

4,466,517

TOP OPENING TOTEBAG BODY REST

Kathleen Y. Spiegelman, 3627 Serra Rd., Malibu, Calif. 90265

Filed Feb. 8, 1982, Ser. No. 346,520
Int. Cl.³ A45C *9/00, 13/26*
U.S. Cl. 190—8 **4 Claims**



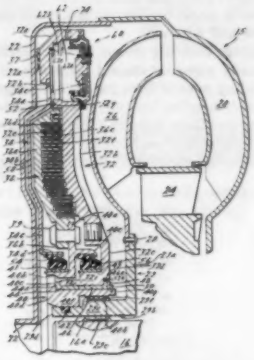
1. A combination body rest and totebag comprising a frame structure, including a pair of U-shaped members each having a pair of downwardly extending legs interconnected across their upper ends by cross piece portions forming first and second handles, a fabric bag secured about the legs, said bag being shaped to form peripheral walls and a bottom wall of a totebag, said totebag supporting said U-shaped members so that the handles extend in spaced parallel arrangement with respect to each other and can move towards and away from each other to facilitate opening and closing said bag by the user, a rigid hinge clamp carried by one handle and having the shape of an S-curve in cross-section to form first and second sleeves encircling the respective handles, means fixedly attaching said first sleeve over one handle with said second sleeve extending towards and under the other handle, said second sleeve having an upwardly facing opening through which said other handle can pass in interference fit and drop into the second sleeve of the clamp, the first handle and attaching means supporting a load tending to twist the second handle down and around the first handle, said second sleeve being large enough to allow said second handle to rotate therein so that when the second handle is secure in the hinge clamp the legs can be separated by rotation to form a stable A-frame for supporting the weight of the user and whenever desired, the handle can be freed from the clamp by twisting the handles with respect to each other, the second handle snapping up and out of the second sleeve to allow separation of the handles and opening of the totebag.

4,466,518

ENGAGEMENT MODULATOR FOR TORQUE CONVERTER BYPASS

Robert S. Mueller, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 13, 1982, Ser. No. 397,739
Int. Cl.³ F16D *25/04*
U.S. Cl. 192—3.29 **5 Claims**



1. An annular generally planar coupling adapted to be positioned within a housing of a torque converter transmission for use as a bypass of the torque converter of such transmission and when so positioned defining with the torque converter housing a main chamber at one side of the coupling receiving the torque converter and a secondary chamber at the other side of the coupling, said coupling including:

A. drive means adjacent a radially inner portion of the coupling adapted to be drivingly connected to a output shaft of the torque converter;

B. means defining an annular clutching surface on said other side of said coupling on an outer peripheral portion of the coupling adapted for clutching coaction with a confronting inner surface of the housing of the torque converter, said coupling being adapted to be mounted within the housing of the torque converter for axial movement between:

(1) a disengaged position in which fluid pressure is maintained on said other side of said coupling and said clutching surface is spaced axially from said confronting inner housing surface so that the transmission drives through the torque converter; and

(2) an engaged position in which fluid pressure is vented at said other side of said coupling and said clutching surface engages said confronting inner housing surface so that the transmission drives through said coupling and the engaged clutching surfaces sealingly separate the main chamber at said one side of said coupling from the secondary chamber at said other side of said coupling; and

C. a control valve assembly positioned in said outer peripheral portion and including:

(1) an axially extending bore in said outer peripheral portion opening at said one side of said coupling in said main chamber;

(2) a rolling diaphragm positioned across the open end of said bore and arranged to traverse said bore between a first position in which it is disposed generally adjacent the open end of said bore and a second position in which it has traversed at least a portion of the axial length of said bore;

(3) spring means disposed in said bore and arranged to urge said diaphragm toward said first position;

(4) first fluid passage means opening at one end in said

main chamber and at its other end in said bore at a location therealong traversed by said diaphragm; and

(5) second fluid passage means, having a larger flow capacity than said first fluid passage means, extending between a portion of said bore and said other side of said coupling radially inwardly of such clutching surface.

4,466,519

DRIVE AND BRAKE SYSTEM FOR MOTOR VEHICLES WITH FOUR-WHEEL DRIVE

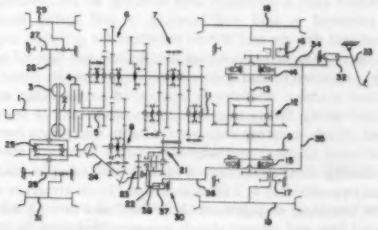
Friedrich W. Römer, Neuss, Fed. Rep. of Germany, assignor to International Harvester Co., Chicago, Ill.

Filed Apr. 9, 1981, Ser. No. 252,524

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016788

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—13 R 2 Claims



1. Driving and braking arrangement for four-wheel motor vehicles, farm tractors in particular, having a primary axle constantly driven by a drive engine via a transmission and brakeable by a service brake, the arrangement comprising:

a hydraulic cylinder connected with a lever means for actuating thereof;

a brake hydraulic line linking said cylinder with said vehicle service brake;

said service brake operatively connectable with said primary axle upon the actuation of said cylinder, thereby applying the braking force to said primary axle;

said brake hydraulic line merging with a clutch line leading to a clutch transferring a torque from a vehicle transmission to a secondary axle differential;

another service brake being connectable with said primary axle, thereby braking both ends thereof;

said clutch line including a clutch engaging cylinder located between said clutch and said hydraulic cylinder;

said primary axle being a vehicle rear axle and said secondary axle being a vehicle front axle;

at least a pair of gears disposed between said clutch and said differential;

said clutch comprising a means permitting a gradual transfer of said torque between shafts rotating with different speeds and proportional to a brake force applied to said primary axle;

said hydraulic cylinder, said service brakes, and clutch cylinder being disposed in series upstream of said clutch;

whereby upon actuation of said cylinder by said lever means, the fluid impulse is communicated to said service brake for braking said primary axle rotation and simultaneously engaging said clutch via said clutch line, thereby engaging a secondary axle drive by transmitting torque thereto from said transmission when said service brake is activated.

4,466,520

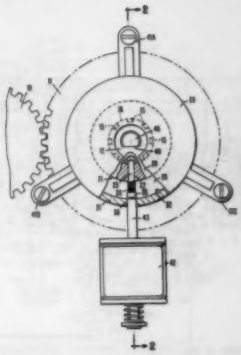
SELF-CONTAINED CLUTCH USEFUL FOR SINGLE REVOLUTION APPLICATIONS

Richard L. Herman, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,826

Int. Cl.³ F16D *11/02*

U.S. Cl. 192—28 4 Claims



1. A clutch for coupling rotary mechanical power between a first member and a second member in response to movement of at least one plunger element comprising:

a hub rotatably attached to one of said members, said hub having at least one surface extending in a direction transverse to the direction of rotation of said hub;

a rotatably mounted plate attached for applying rotary drive to the other of said members, said plate having a hole therethrough located for aligning a surface of said hole with said hub surface at least once for each revolution of said hub;

a pin movably mounted in said plate hole and having a length for assuming first and second positions, one end portion of said pin engaging said aligned hub and plate when said pin is in said first position, the said one pin end portion clearing said hub surface when said pin is in said second position, the opposite end portion of said pin having a shoulder extending transverse to the length of said pin;

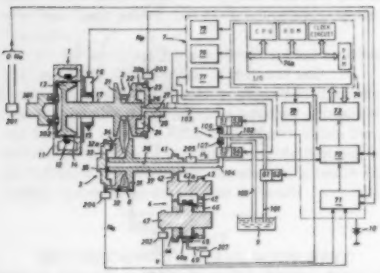
means retaining the opposite end portion of said pin for maintaining said pin first position for at least a portion of the rotation of said hub, said retaining means including means permitting said pin opposite end to move away from said plate for assuming said pin second position in at least one location for each revolution of said plate, said retaining means receiving said plunger element into engagement with said pin opposite end at said one location for shifting said pin from said second position to said first position in response to said plunger element movement; and

means urging said pin toward said second position at said plunger element receiving location, said urging means including a cam surface having a fixed relation to said first and second members in position for engaging said pin shoulder for directing said pin into said second position.

4,466,521
ELECTRIC CONTROL SYSTEM FOR AUTOMOBILE TRANSMISSION

Yoshiyuki Hattori, Toyoake; Kazuma Matsui, Toyohashi; Toshihiro Takei, Kariya; Hideyuki Hayakawa, Nishio, and Takahiro Goshima, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 24, 1981, Ser. No. 324,573
Claims priority, application Japan, Nov. 27, 1980, 55-167215
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—0.032 6 Claims



1. In an electric control system for an automobile transmission comprising a driving pulley unit of the V-shaped type provided with a drive shaft drivingly connected to an output shaft of an internal combustion engine for a vehicle, and with a pair of facing, conical sheaves, assembled for rotation about said drive shaft, a driven pulley unit of the V-shaped type provided with a driven shaft and a pair of facing, conical sheaves, assembled for rotation about said driven shaft, an endless transmission member wound around said pulley units for transmitting an output torque from said engine to said driven shaft with an infinitely variable transmission ratio under control of each mutual distance of said conical sheaves of said respective pulley units, and first and second actuators associated with each of said pulley units for adjusting the distances between said respective conical sheaves thereof under control of fluid under pressure applied thereto,

the improvement comprising:

means for determining an optimum fluid pressure in relation to the actual output torque of said engine and the actual transmission ratio between said pulley units;

means for determining an optimum rotational speed of said engine for low fuel consumption in relation to the actual output power of said engine and determining an optimum transmission ratio related to said optimum rotational speed of said engine;

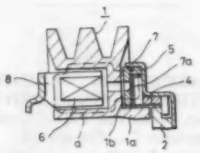
means for producing a first electric control signal indicative of the difference between said optimum fluid pressure and the actual fluid pressure in one of said actuators and producing a second electric control signal indicative of the difference between said optimum transmission ratio and the actual transmission ratio; and

an electrically operated fluid control means responsive to said first and second electric control signals to control the pressure of fluid applied to one of said actuators and to control the flow quantity of fluid applied to the other actuator.

4,466,522
ELECTROMAGNETIC SPRING-WOUND CLUTCH

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,342
Claims priority, application Japan, Jul. 15, 1981, 55-99393
Int. Cl.³ F16D *7/00, 27/00, 41/20*
U.S. Cl. 192—36 7 Claims



5. An electromagnetic spring-wound clutch comprising: a rotatably disposed driving member; a driven member arranged in axial alignment with said driving member for rotation about a common axis; a stationary coil housing; an electromagnetic coil mounted in said coil housing; a coil spring mounted around said driving and driven members for gripping engagement therewith, said coil spring having one end thereof operatively connected to said driven member; an annular first clutch armature member operatively connected to the other end of said coil spring facing said driving member; and at least one second clutch armature member rotatably interposed between said driving member and said first clutch armature member; said driving member having a radially extending surface arranged opposite said at least one second clutch armature member for frictional engagement therewith; said driving member and said first and second clutch armature members being disposed immediately adjacent each other and in axial alignment with each other; said electromagnetic coil, when energized, producing electromagnetic force to thereby cause attraction of said first clutch armature member and said at least one second clutch armature member toward said driving member to bring said first and second clutch armature members and said driving member into firctional engagement with each other immediately after occurrence of slight slips between said surface of said driving member and one of said at least one second clutch armature member adjacent thereto and between adjacent ones of said first clutch armature member and said at least one second clutch armature member; and

magnet means provided between said radially extending surface of said driving member and said at least one second clutch armature member for causing said at least one second clutch armature member to be attracted toward and held in contact with said radially extending surface during deenergization of said electromagnetic coil.

4,466,523
RATCHET MECHANISM

Joseph P. De Carolis, Bristol, and Lawrence L. Billings, East Hartford, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Jun. 29, 1982, Ser. No. 393,459
Int. Cl.³ F16D *11/06;* B25B *13/46*
U.S. Cl. 192—43.1 15 Claims

6. A ratchet handle for a hand tool comprising:

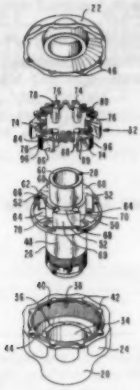
a housing having a substantially cylindrical interior wall defined by a plurality of parallel longitudinal teeth;

a shifter received in said housing, said shifter comprising at least two ears;

a drive means received by said shifter and adapted to receive the shank of the hand tool, said shifter being rotatably shiftable to each of three positions relative to said drive means; and

pawl means mounted on said drive means to selectively

provide a rotational drive connection between said housing and said drive means, said pawl means comprising at least two pairs of opposing pawls, said pawls being urged



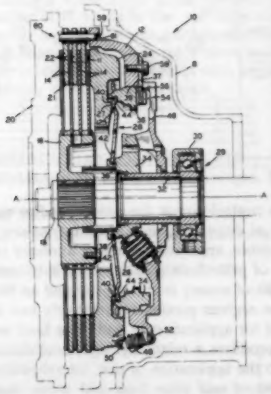
to engage said housing teeth by a single spring, said shifter ears being adapted to selectively interact with said pawl means.

4,466,524

PLATE LOCATING APPARATUS FOR MULTIPLE DISC CLUTCH

Wendell C. Lane, Kendallville, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 24, 1982, Ser. No. 361,296
Int. Cl.³ F16D *13/75, 65/52*
U.S. Cl. 112—70.25 **16 Claims**



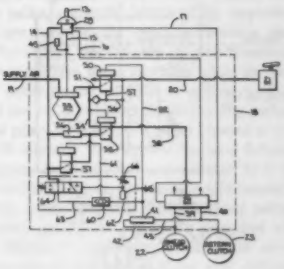
1. In a clutch assembly including an intermediate plate, a cover, and a pressure plate disposed therebetween, a driven disc between said pressure plate and said intermediate plate, said intermediate plate containing an aperture therethrough, said aperture positioned radially outwardly of said driven disc; means for axially locating said intermediate plate relative to said driven disc, comprising: (a) an axially extending rod having one end thereof affixed to said cover, said rod extending through said aperture, (b) a cylindrical sleeve piloted on said rod and extending through said aperture, said sleeve containing abutment means at opposite ends thereof, said abutment means being disposed for contacting respective sides of said intermediate plate; and (c) means on said sleeve for engaging said rod to restrict axial movement of said sleeve relative to said rod to one direction only.

4,466,525

MARINE PROPULSION CONTROL SYSTEM FOR LOW SPEED MANEUVERING

Dale R. Spridco, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Jan. 18, 1982, Ser. No. 339,847
Int. Cl.³ B60K *41/02*
U.S. Cl. 192—0.076 **5 Claims**



1. A pneumatic clutch control system for a marine propulsion drive including a prime mover controlled by a throttle speed governor, a drive train for transmitting power from the prime mover to a propeller drive shaft, an air inflatable clutch for connecting the prime mover to said drive train, and throttle means for actuation of the propulsion system, said control system being adapted for connection to a source of pressurized air and comprising:

first and second air branches each leading from said air sourse to a master control valve which is shiftable to connect one or the other of said air branches to said clutch;

said first air branch including means operatively connected to said throttle means to provide an air output that is responsive to air pressure supplied to said first branch by said throttle means;

said master control valve being responsive to the air output from said first branch to disconnect said first branch and connect said second branch to said clutch when said air output reaches a first control pressure;

a throttle governor control means connected to receive the air output of said first air branch and for providing a speed pressure signal to said throttle speed governor which is proportional to said air output; and said second air branching including

a choke valve connected between said air source and said master control valve and adapted to continue the inflation of said clutch through said master control valve until the pressure within said clutch reaches a second control pressure,

a piloted boost valve connected between said air source and said master control valve in parallel with said choke valve, said boost valve being normally closed but adapted when piloted at said second control pressure to connect the source of pressurized air directly to the clutch through said master control valve, and

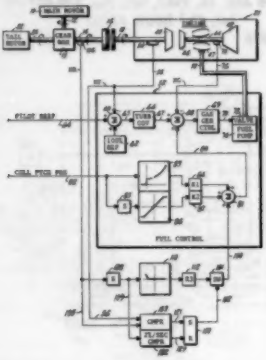
a maneuvering valve disposed in the connection between said air source and the pilot of said boost valve, said maneuvering valve normally completing the connection between said air source and the pilot of said boost valve but being shifted to disrupt the connection after the speed pressure signal rises to a predetermined level.

4,466,526

HELICOPTER ENGINE CONTROL WITH ROTOR SPEED DECAY ANTICIPATOR

James J. Howlett, North Haven, and Raymond D. Zagranski, Somers, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,300
Int. Cl.[3] F16D *23/02*; B60K *41/02*
U.S. Cl. 192—0.096 3 Claims



1. A helicopter, comprising:
a rotor;
an engine;
rotor drive means including an overrunning clutch for connecting said rotor to said engine whenever the speed of said rotor does not exceed the speed of said engine; and
engine control means for providing an engine speed signal indicative of the rotary speed of said engine, for providing a fuel command signal indicative of fuel flow required for desired engine operation, and for metering fuel flow to said engine in response to said fuel command signal;
characterized by:
rotor speed means for providing a rotor speed signal indicative of the rotary speed of said rotor; and
said engine control means comprising means for providing, in response to said rotor speed signal, a rotor deceleration signal indicative of the deceleration of said rotor in excess of a predetermined threshold deceleration, for providing an autorotation signal indicative of said rotor being declutched from said engine, and for providing said fuel command signal with a fuel increase-indicating component in response to said rotor deceleration signal.

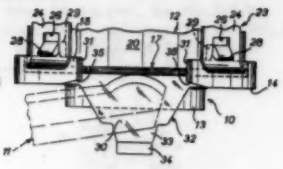
4,466,527

CLUTCH RELEASE BEARINGS

René Billet, Lamorlaye, France, assignor to Valeo, Paris, France

Filed Apr. 7, 1981, Ser. No. 251,922
Claims priority, application France, Apr. 8, 1980, 80 07812; Jan. 29, 1981, 81 01675
Int. Cl.[3] F16D *23/14*
U.S. Cl. 192—98 25 Claims

1. A clutch release bearing comprising a plastic operating member having a transverse flange and being adapted to be controlled by an actuating member, a metal bearing member engageable with the actuating member, a drive or thrust member adapted to coact with a release mechanism of an associated clutch in response to said operating member, coupling means for axially coupling said drive or thrust member to said operating member, said metal bearing member being disposed axially between said drive or thrust member and said transverse flange of said operating member, said transverse flange having discrete access passages providing access for the actuating member to said metal bearing member, said metal bearing member consisting of a substantially flat washer, said coupling means urging said thrust or drive member axially toward the side of



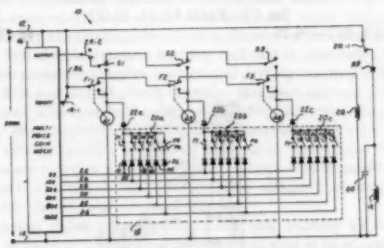
said bearing member axially remote from said transverse flange.

4,466,528

APPARATUS FOR PREVENTING CIRCUIT BURN-OUT IN MULTI-PRICE MERCHANDISERS

David Hoffman, Hillsdale, N.J., assignor to Rowe International, Inc., Whippany, N.J.

Filed Aug. 13, 1981, Ser. No. 292,692
Int. Cl.[3] G07F *11/00*
U.S. Cl. 194—1 N 3 Claims



3. In a control circuit for a merchandise machine having a plurality of dispensing units each comprising an energizable drive member, apparatus including a money register having a plurality of price lines adapted to be activated in response to the deposit of money in the register and an output terminal at which the register produces a relatively low level interrogating signal for application to said price lines and at which the register produces a relatively high level driving signal in response to the application of said interrogating signal to activated ones of said price lines and means connected to said output terminal for applying said interrogating signal to said price lines, said last-named means including respective groups of pricesetting switches, said groups corresponding in number to the number of said units, respective diodes connecting the pricesetting switches to said price lines, and respective doublepole double-throw switches corresponding in number to the number of said units, the poles of said switches being connected to said terminal, a normally-open contact of one pole of a switch being connected to a group of price-setting switches associated with the corresponding unit, a normallyopen contact of the other pole of the switch being connected to the energizable drive member of the corresponding unit.

4,466,529

SEPARATION UNIT FOR PROCESSED BOOK BLOCKS

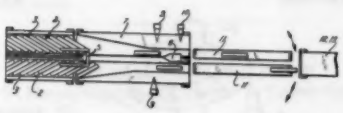
Hans-Peter Thrandorf, Grossdalzig, and Achim Kratzsch, Leipzig, both of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 74,996, Sep. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 70,049, Aug. 27, 1979, abandoned. This application Dec. 29, 1981, Ser. No. 335,388

Claims priority, application German Democratic Rep., Aug. 29, 1978, 207511

Int. Cl.³ B65G *47/10*

U.S. Cl. 198—368 6 Claims



1. In a feeding arrangement for book blocks discharged one-by-one in an upright position on a first conveying means travelling at a first speed so as to form two parallel horizontal book stacks on the first conveying means, a combination comprising a separating device including a second conveying means travelling at a higher speed than that of said first conveying means, and two stationary stack supports bridging said first and second conveying means in the path of movement of respective stacks to hold leading parts of the stacks while the second conveying means due to its higher speed separates individual book blocks from each stack and advances the separated book blocks in two parallel series; a gating switch arranged between the two series of book blocks to stop temporarily the advance of a book block in one series while releasing book blocks in the other series, and vice versa; and position sensors arranged for detecting relative positions of the book blocks in respective series, said sensors cooperating with said gating switch to release, in response to the detection of the leading edge, a leading book block in the other series while stopping the leading book block in the one series and subsequently releasing the latter book block in response to the detection of the trailing edge of the leading book block in said other series, so that the released book blocks in each of said series advance at accurately timed spatial intervals.

4,466,530

FEED MECHANISM FOR PARTS

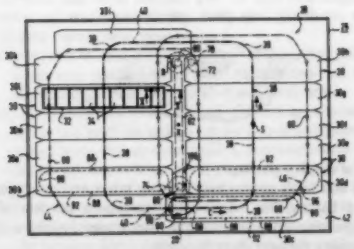
Gerd Stückler, Birkenweg 18, D-8151 Osterwarngau, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 359,166

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114032

Int. Cl.³ H05K *13/02;* B65G *35/06*

U.S. Cl. 198—472 23 Claims



1. Feed mechanism for parts, particularly for an assembly table for printed circuit boards, comprising a plurality of oblong pallets provided with vessels for receiving parts, a guide system conducting said pallets along a looped path, said pallets being arranged essentially parallel to one another, said looped path including two moving paths located parallel next to one another and extending approximately perpendicular to the longitudinal direction of said pallets, and two transition paths connecting said two moving paths, a drive for moving said pallets along said looped path, said drive having a drive element each in the region of said two transition paths, each said drive element acting on a first engagement means of the respective pallet located in said transition path, wherein several pallets are arranged in each moving path with mutual lateral contacts and are moved jointly step-by-step by the width of one pallet, while the pallets of the respectively other moving path are moved in the opposite direction, and wherein a pallet can be moved step-by-step in each transition path by means of the respective drive element, while the pallet in the respectively other transition path is moved in the opposite direction and the pallets located in said moving paths stand still in the normal position, wherein a pallet located at the end of a transition path laterally rests against the next following pallet in the subsequent moving path, and wherein four slanting or rounded deflection paths are provided in said looped path each deflection path connecting one of said moving paths with one of said transition paths, said pallets are provided with second engagement means for engagement with each drive element during movement of said pallets along said deflection paths from an engagement position on each of said deflection paths to the beginning of the next following transition path respectively and from the end of said transition paths to a disengagement position on said next following deflection path respectively, and wherein said engagement and disengagement positions on each of said deflection paths are displaced relative to the next lying transition path towards the respective other transition path by a non-vanishing distance being less than the width of a pallet.

4,466,531

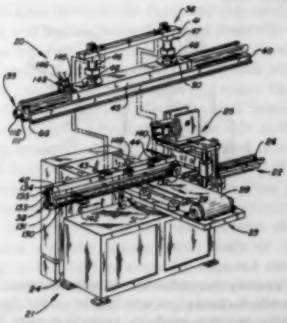
APPARATUS FOR MAKING ELASTOMERIC FABRIC

Robert C. Baugher, Tallmadge; Ralph F. Kiemer, and Raymond R. Smith, Jr., both of Akron, all of Ohio, assignors to The Steelastic Company, Akron, Ohio

Filed Jun. 11, 1982, Ser. No. 387,485

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—486 15 Claims



1. A transfer mechanism for the movement of elastomeric ribbon between a first and second mechanism of a ply fabrication apparatus comprising:

shuttle means for selectively engaging the ribbon and including:

a raceway presenting opposed flanges; and

channel means projecting downwardly from said race-

way, said raceway and channel means defining a movable shuttle; first movement means for translation of said shuttle upwardly and downwardly with respect to said first and second mechanisms, said first movement means being located over one of said two mechanisms and including:

first support means rigidly attached to said apparatus;

second support means for mounting said shuttle and having an overall length less than the length of said shuttle;

roller means rotatably carried by said second support means and engageable with said opposed flanges of said raceway for parallel protraction and retraction of said shuttle therealong whereby said shuttle can be protracted from said first mechanism to said second mechanism without direct support over said second mechanism;

first rod means;

actuating means for moving said first rod means, one end of said first rod means being connected to one of said support means, said actuating means being connected to the other of said support means, and the other end of said first rod means being movable with respect to the other of said support means to which said actuating means is connected;

first intermeshing rack and gear means connected to one end of said first rod means;

shaft means rotatably connected to said first gear means;

second intermeshing rack and gear means said gear means being affixed on said shaft means and rotatable therewith; and

second rod means connected to said second rack and gear means at one end and being connected at the other end to the support means to which said first rod means is connected whereby said first and second rod means are protracted and retracted in unison to move one of said support means toward and away from the other of said support means in continuous parallel alignment therewith; and

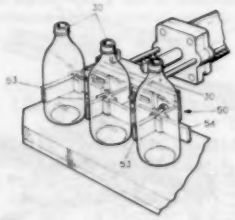
second movement means for translation of said shuttle between said first and second mechanisms.

4,466,532

REPLACEABLE FINGER ELEMENTS FOR TRANSPORTING HOT GLASS ARTICLES

Lester C. Minneman, Maumee, and Jack I. Perry, Sylvania, both of Ohio, assignors to Dura Temp Corporation, Holland, Ohio

Filed Sep. 4, 1981, Ser. No. 299,287
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—490 **25 Claims**



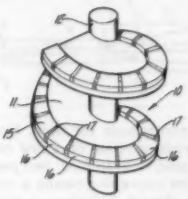
1. In a conveyor system for serially transporting and positioning newly-formed glass articles, the system having a plurality of article moving modules extending over the conveyor transport surface in spaced-apart array, the combination of each module comprising a finger holder having at least one tapered female slot therein disposed in generally vertical relation facing the said conveyor transport surface, and at least one rigid finger member consisting of molded solid-lubricant thermoset material having at least one complemental tapered recessed tongue adjacent a first linear edge for its slip-fit retention in cantilevered relation within said finger holder over or adjacent to said transport surface, said finger member having a double-tapered recessed male tongue extending in symmetry from opposing edges normal to said first linear edge to a medial region and with each side of said tongue being complemental to the tapered female slot in said finger holder for its reversible usage.

4,466,533

BLADE EDGE WEAR CLIPS

Warren M. Shwayder, 2335 E. Lincoln, Birmingham, Mich. 48008

Filed Sep. 30, 1982, Ser. No. 431,321
Int. Cl.³ B65G *33/26*
U.S. Cl. 198—676 **9 Claims**



1. Blade wear clips for attachment in an end-to-end aligned row upon the edge of the wear surface of a blade, such as a curved auger blade and the like, comprising:

each clip being formed of a roughly square, flat channel, made of a weldable, thin steel sheet-like material, having a base and opposite short legs to provide the channel cavity therebetween;

each channel cavity being filled with a matrix formed of packed together irregular size and shape hard carbide particles and a soft, ductile brazing type material filling the spaces between the particles and generally surrounding the particles, said clips being weldable upon the face of the blade in an aligned row adjacent the blade edge to provide a wear resistant strip;

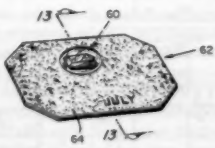
and said particles being relatively movable within the matrix, under impact to the clips, so that despite said hard particles being brittle, said matrix and the particles are resistant to impact forces and impact breakage.

4,466,534

DISPLAY PACKAGES

J. Malcolm Dunn, 305 Via Montego, San Clemente, Calif. 92672

Filed Sep. 13, 1982, Ser. No. 417,149
Int. Cl.³ B65D *25/54*
U.S. Cl. 206—45.34 **8 Claims**



1. In a display package:

front and back covers each having inner and outer surfaces and having free edges along at least a portion of their respective margins and said front cover having a display opening formed therethrough;

an insert comprising a base sheet having a front and back side and having a display opening formed therethrough

having a size no less than that of said display opening of the front cover the margins of the cover extending beyond the margins of the insert;

the insert further comprising two layers of adhesive one at its front side and the other on its back side and extending to the margin of the display opening, said layers of adhesive being bonded to the inner surfaces of said front and back covers, respectively; and

a transparent window pane having a size exceeding that of the display opening of said insert and interposed between said inner surface of the front cover and the adhesive layer at the front side of the insert;

the pane and the display openings of the front cover and insert being aligned each with the others; and

an article to be displayed disposed in said display opening of said insert.

4,466,535

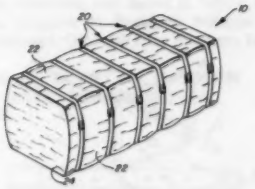
SLIP SEAL JOINT FOR STRAP

Gale W. Huson, Glenview, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Dec. 29, 1982, Ser. No. 454,257

Int. Cl.³ B65D *71/00*

U.S. Cl. 206—83.5 **2 Claims**



1. In combination, the elements comprising:

a bale of compressed resilient material having a generally parallelpiped shape with four side surfaces and two end surfaces;

at least one strap with two oppositely facing major side surfaces having predetermined frictional characteristics disposed in a loop around the bale to overlap a predetermined length of an inner end portion of the strap adjacent the bale with an outer end portion of the strap so that the confronting strap surfaces of the overlapping end portions are generally in surface contact or in alignment to be in surface contact for effecting a frictional engagement, said strap inner end portion being disposed at least partially around one corner defined by two of said bale side surfaces; and

a seal at one of said bale side surfaces defining said one corner of said bale, said seal being deformed closed about both of said overlapping strap end portions with one part of said seal adjacent one of said overlapping strap end portions and with another part of said seal adjacent the other of said overlapping strap end portions, said deformed closed seal including:

(1) a crimp of said one part of said seal against said one of strap end portion to prevent withdrawal of said one strap end portion from said closed seal, and

(2) a crimp of said other part of said seal against said other strap end portion with a predetermined degree of frictional force engagement which, in combination with the frictional forces between the bale and the strap as well as between the overlapping strap portions resulting from the bale expansion, is sufficiently great to restrain said other strap end portion relative to said seal when the tension force on said strap is equal to or less than a predetermined tension force but which is sufficiently low to permit relative movement between said overlapping strap end portions when the tension force on said strap exceeds said predetermined tension force.

4,466,536

PATTERN FOR A BOX FOR CIGARETTES OR CIGARILLOS

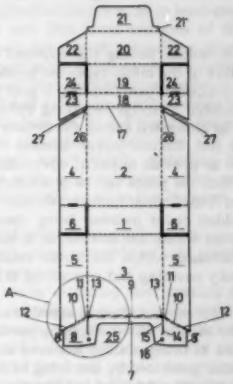
Joachim Zeitel, Hagen, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,977

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150561

Int. Cl.³ B65D *85/10, 5/66;* B65B *11/48*

U.S. Cl. 206—273 **12 Claims**



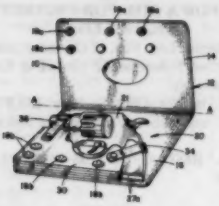
1. In a pattern for a box, the pattern being provided with a central section for defining a receiving space in the box and a pair of end sections which respectively will form the neck of the box and a lid coupled to the rear wall of the box, the box neck forming end section including a front defining section and two oppositely disposed side defining sections connected thereto, the side sections being foldable with respect to the front section along fold lines, the central section including a front wall defining section and a pair of side wall defining sections which will be folded with respect thereto along fold lines, the fold lines between the front and side sections of the neck forming end section being displaced inwardly relative to the fold lines between the front wall and its associated side walls of the central section whereby the box neck will be offset relative to the outside wall of the receiving space, the fold lines between the front and side sections of the neck forming section be interrupted by cuts which form ears, the side sections of the neck forming section being partially separated from adjacent side walls of the central section by cuts and the front section of the neck forming section being coupled to the front wall of the central section by an embossed edge, the improvement comprising: the junction between the side sections of the neck forming section and the adjacent side walls of the central section being in the form of centrally disposed embossed regions with slots extending in both directions therefrom to the opposite edges of the neck forming section side sections, a punched-out region at each end of the embossed edge between the front section of the neck forming section and the central section, the width of the punched-out regions being greater than the thickness of the material in which the pattern is formed, the inwardly disposed pair of said cuts between the side sections and side walls terminating at respective of the punched-out regions.

4,466,537

CONCEALABLE HOLSTER

Lawrence E. McMahan, 2129 Lewis Dr., Lakewood, Ohio 44107

Filed Sep. 30, 1982, Ser. No. 431,314
Int. Cl.³ B65D *85/00*
U.S. Cl. 206—317 **6 Claims**



1. A firearm holster having the outward appearance of a billfold or wallet of the bifold-type, the holster being adapted to carry and conceal a pistol having a grip portion, a frame portion, a rotatable cartridge receiving cylinder, a trigger, a hammer, and an elongated barrel, the holster comprising:

a generally flat, flexible cover member foldable along a centerline to provide adjacent cover member halves between which the pistol can be positioned for firing from within the folded cover member, the barrel associated end of the folded cover member being open to permit free egress, from within the holster, of a bullet fired by the pistol positioned within the cover member, said halves substantially covering and concealing at least the sides of the pistol;

a generally rigid support block fastened to at least one of said halves, the support block engaging portions of the pistol to maintain its firing position between said halves against recoil forces generated by the firing of the piston;

at least one retaining strap for holding the pistol in position on the support block; and

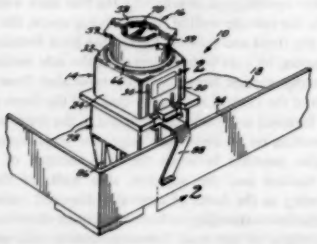
a trigger finger receiving aperture provided in at least one of said halves to permit firing of the pistol from within the folded cover member.

4,466,538

HYPODERMIC NEEDLE DISPOSAL SYSTEM

Richard F. Gianni, Danville, Calif., assignor to Biosafety Systems, Inc., San Diego, Calif.

Filed Apr. 15, 1983, Ser. No. 485,203
Int. Cl.³ B65D *25/00*; B65F *1/02, 7/00*
U.S. Cl. 206—366 **35 Claims**



1. A disposal system for used hypodermic needles and the like, comprising:

a bottle having an upwardly open bottle opening formed therein;

a cap assembly mounted on said bottle and including a first member secured against rotation relative to said bottle in a position overlying the bottle opening and having a relatively small first passage formed therein off-center relative to the bottle opening, and a second member overlying said first member and having a relatively small second passage formed therein off-center relative to the bottle opening, said second member being rotatable relative to said bottle and first member for movement from an open position with the first and second passages aligned to permit dropping of needles into the bottle to a closed position, with the second passage moved out of alignment with the first passage to prevent dropping of needles into the bottle; and

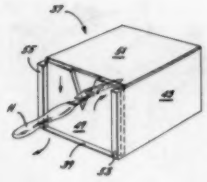
means cooperating between said second member and said bottle for substantially locking said second member in said closed position against further rotation.

4,466,539

SURGICAL BLADE REMOVER

Christopher M. Frauenhoffer, 950 Walnut St., Philadelphia, Pa. 19107

Filed Jun. 9, 1983, Ser. No. 502,448
Int. Cl.³ B65D *25/00*; B65F *7/00*; A61B *19/02*; A61F *13/00*
U.S. Cl. 206—370 **12 Claims**



1. A surgical plate remover for separating a surgical blade from a blade holder with spring action comprising:

a plate;

means for holding said plate in a relatively secured position; and

a vee-shaped notch in an essentially flat section of said plate, said notch being to engage the sides of said blade at the heel portion thereof when said blade is inserted partially therethrough for springing said blade off of said holder.

4,466,540

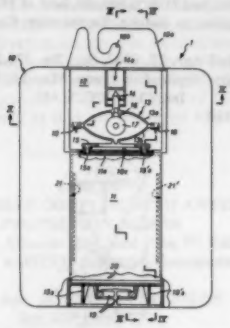
MERCHANDIZING PACKAGE

Robert Lotrous, Chailly-en-Gatinais, and Paul Darbois, Poras, both of France, assignors to Plastiques Industriels Thecla, Giromagny, France

Filed Jun. 24, 1983, Ser. No. 507,482
Claims priority, application France, Jun. 25, 1982, 82 11138
Int. Cl.³ B65D *85/672*; A45C *13/18*; E05B *47/08*
U.S. Cl. 206—387 **10 Claims**

1. A re-usable theft-resistant package suitable for self-service merchandizing of goods, comprising a cover, a lock adapted to be operated mechanically and electromagnetically and to retain said cover, a bolt member incorporated in said lock, a profiled opening in said package adapted to admit a complementarily profiled rod adapted to push back said bolt member and forming part of a corresponding key device, a fly-weight of ferromagnetic material disposed to resist selectively pushing back of said bolt member and adapted to permit pushing back of said bolt member by retracting in response to a magnetic field and a return spring adapted to resist retraction of said

fly-weight, the arrangement being such that said fly-weight is retracted by a magnetic field produced by said key device to



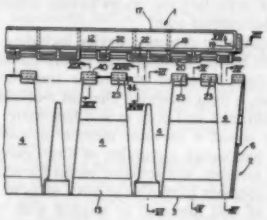
permit pushing back of said bolt member so as to unlock the package.

4,466,541

MOLDED CONTAINER WITH INTEGRAL HINGE

Charles P. Tabler, Hamilton, and Daniel R. Miller, Cincinnati, both of Ohio, assignors to Buckhorn Material Handling Group Inc., Cincinnati, Ohio and Ekco Products, Inc., Wheeling, Ill.

Filed Apr. 26, 1982, Ser. No. 371,999
Int. Cl.³ B65D *21/06, 51/04*
U.S. Cl. 206—506 **10 Claims**



1. A nestable and stackable container, comprising

a unitary, one piece, container body of molded synthetic resin material having a bottom wall and two pairs of opposed side walls integrally joined together and integrally extending upwardly from the periphery of said bottom wall;

said side walls being shaped and extending upwardly and outwardly from said bottom wall to permit said container body to be nested within a like container body and the latter to be nested therein when disposed in vertical aligned relationship therewith;

a pair of bails, each being a unitary, one piece, construction of molded synthetic resin;

hinge means unitary in one piece only with each of said bails and one pair of said opposed sidewalls for pivotally connecting said bails to said one pair of sidewalls, respectively, for movement about respective parallel horizontal axes that are parallel to said bottom and the longitudinal extent of said one pair of sidewalls to provide for pivotal movement of said bails relative to said container body between a stacking position wherein each bail extends generally horizontally inwardly from its associated pivot axis into the adjacent interior of the container body toward the opposed sidewall of said one pair of sidewalls to provide respective upwardly facing support stack surfaces, and a nesting position wherein each bail is disposed outwardly of the adjacent interior of the associated sidewall to permit said nesting of two like container bodies;

bail support surfaces on said one pair of opposed sidewalls spaced from the adjacent corresponding pivot axes and engaging the respective bails in their stacking position at contact points spaced radially from said respective pivot axis to resist inward turning movements on said bails;

said bail structures, when in said stacking position, having their support stack surfaces simultaneously engaging a like container stacked thereon in vertical aligned relationship above said container body;

said hinge means comprising a plurality of longitudinally spaced, upwardly extending, first pivot portions of molded synthetic resin integral, in one piece, with the upper edge of each of said one pair of sidewalls, a plurality of longitudinally spaced second pivot portions of molded synthetic resin integral, in one piece, with and along a longitudinal edge of each of said bails that are of a spacing and of a longitudinal length so as to inter-engage longitudinally with said first pivot portions of the associated sidewall of said one pair of sidewalls, a plurality of pivot pins coaxial with a respective pivot axis extending from at least one of said first pivot portions and said second pivot portions, and said pivot pins being constructed of molded synthetic resin integral, in one piece, with said one pivot portions, and the other of said first and second pivot portions having longitudinally extending bearing apertures coaxial with said respective pivot axes and of a diameter substantially equal to the diameter of respective pivot pins;

said second pivot portions integrally and in one piece including means providing assembly of said pivot pins within respective apertures;

said assembly means including slots opening radially from said bearing apertures to permit only radial assembly of said pins through said slots into said bearing apertures only when said bails are in an assembly position that is pivotally spaced from said pivotal movement of said bails relative to said container body between the stacking position and the nesting position; and

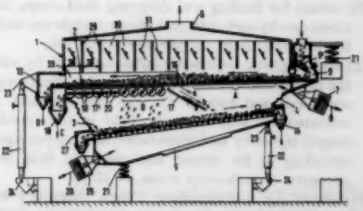
said bails and said sidewalls having interengaging stop surfaces positively preventing rotation of said bails through said nesting position to said assembly position.

4,466,542

SEPARATING CONTRIVANCE FOR CEREALS

Hans Oetiker, St. Gallen, and Roman Müller, Niederuzwil, both of Switzerland, assignors to Gebruder Buhler AG, Uzwil, Switzerland

Filed Feb. 5, 1982, Ser. No. 346,012
Claims priority, application Switzerland, Feb. 23, 1981, 1170/81
Int. Cl.³ B07B *9/00*; B03B *4/00*
U.S. Cl. 209—44.2 **27 Claims**



1. Separating contrivance for cereals and similar grain product, comprising:

two air-penetrable, inclined fluidized bed tables arranged one over the other and separately supported for independent oscillation in relation to a frame;

means defining an inlet leading to one end of the upper fluidized bed table;

means defining a first outlet spaced from the inlet for receiving the light grain fraction from the upper fluidized table;

means defining a second outlet between the inlet and first outlet for receiving the heavy grain fraction from the upper fluidized table;

means located at one end of the lower fluidized table for defining a third outlet for receiving heavy impurities such as stones and the like;

means located at the other end of the lower fluidized bed table for defining a fourth outlet for receiving the heavy grain fraction from said lower fluidized bed table;

means for independently supporting said fluidized bed tables;

first drive means for oscillating said upper fluidized bed table in a predetermined direction; and

second drive means for oscillating said lower fluidized bed table in another predetermined direction.

4,466,543

METHOD AND DEVICE FOR DISTINGUISHING BETWEEN FIELD CROPS, PARTICULARLY POTATOES ON ONE HAND AND STONES OR CLODS OF SOIL ON THE OTHER HAND

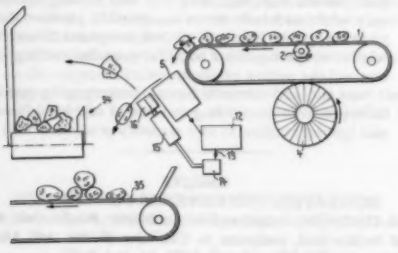
Hermann Zwahlen, Suberg, and Ulrich Remund, Zollikofen, both of Switzerland, assignors to Bystronic Maschinen AG, Butzberg, Switzerland

Filed Sep. 11, 1981, Ser. No. 301,120

Claims priority, application Switzerland, Oct. 2, 1980, 7354/80

Int. Cl.³ B07C *5/34*

U.S. Cl. 209—556 **7 Claims**



1. An apparatus for separating field crops, particularly potatoes, from stones and clods of soil comprising:

(a) at least one sensor having a membrane and an electromagnetic transducer having a magnetic field that penetrates through said membrane;

(b) means for feeding and dropping field crops, stones and clods one-by-one onto said sensor membrane and through the magnetic field outside said membrane;

(c) said magnetic field being influenced both by vibration of the membrane due to impact thereof by field crops, stones and clods and passage through said magnetic field, the influence on said magnetic field in turn producing an output signal by said transducer, said output signal corresponding to the impact and magnetic field influencing property of each crop, stone, or clod;

(d) means for distinguishing a high frequency transducer signal induced by stone impacts and a lower frequency transducer signal induced by clod magnetic influence and for generating a separating signal upon detection of a stone or clod; and

(e) separating means for separating stones and clods from crops, said separating means being actuated by said separating signal.

4,466,544

PHOTOELECTRIC DETECTION DEVICE FOR COLOR SORTING APPARATUS

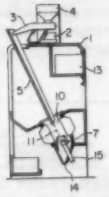
Toshihiko Satake, and Hideki Sakaki, both of Higashihiroshima, Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,239

Claims priority, application Japan, May 14, 1981, 56-73036

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—580 **4 Claims**



1. In a color sorting apparatus comprising at least one chute having an upstream end and a downstream end; means for feeding a mixture of grains having a desired color and grains having different colors onto said upstream end of each chute to allow the mixture to flow down along each chute and to be shot out of said downstream end thereof along a predetermined path; light source means for applying light to the grains passing along said predetermined path to allow the light to be reflected by and/or transmitted through the grains passing along said predetermined path; control means for receiving a below-mentioned light signal to generate a control signal; and means operative in response to the control signal from said control means for deflecting the grains having different colors out of said predetermined path,

a photoelectric detection device including at least one lens barrel having therethrough a bore through which passes the light reflected by and/or transmitted through the grains, a light-receiving element receiving the light passing through said bore in said lens barrel to generate said light signal, a movable member movably supported by said lens barrel, a plurality of filters carried on said movable member, and actuator means for actuating said movable member to move the same so as to allow a selected one of said filters to be aligned with said bore in said barrel.

4,466,545

ARTICLE GRADING APPARATUS

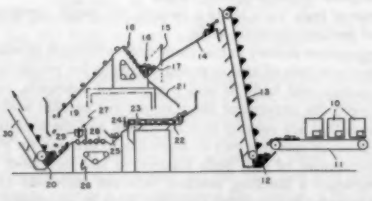
Raymond G. W. Wright, Hauxton, England, assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 18, 1982, Ser. No. 389,787

Claims priority, application United Kingdom, Jun. 19, 1981, 8119056

Int. Cl.³ B07B *13/075*

U.S. Cl. 209—684 **13 Claims**



1. A method of grading articles according to their size, comprising disposing said articles at an end portion of a walking beam conveyor (18) which is inclined to the horizontal and

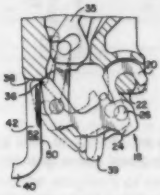
which includes a plurality of relatively movable pockets (35,37), picking up articles in said pockets (35, 37) and conveying them along the conveyor (18) by transferring each article from pocket to pocket, characterised in that the dimensions (d_1, d_2) of each pocket (35, 37) respectively parallel and lateral to the conveying direction are less than the dimensions of those of said articles which are greater than a preselected size, and the articles whose dimensions exceed those of the pockets (35, 37) are either not picked up by the pockets or fall out of the pockets under gravity as they are conveyed by the conveyor (18).

4,466,546

BOTTOM SHELF COUPLER WITH ANTICREEP PROTECTION MEANS

Russell G. Altherr, Munster, Ind., and John W. Kaim, Chicago, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 26, 1982, Ser. No. 371,590
Int. Cl.³ B61G *3/24*
U.S. Cl. 213—148 **1 Claim**



1. A railway coupler comprising a coupler head, said coupler head having a depending bottom shelf extending from a front face ledge,

a lock movable within said coupler head between locked and released positions,

a locklift means operatively connected to said lock, said locklift means having a connector means and a toggle, said connector means having one end extending therefrom to form a prong means,

said bottom shelf including a vertical support portion having a chamfer facing the locklift means, and said connector means having a side face opposite said prong means, said side face having a chamfer facing the bottom shelf vertical support portion to permit said connector prong means to contact said ledge when said connector is laterally displaced.

4,466,547

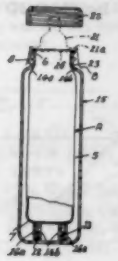
DISPOSABLE FLEXIBLE CONTAINERS FOR BABY FEEDING BOTTLES

Klaus Klittich, P.O. Box 501, Germiston, Transvaal, South Africa

Filed May 24, 1982, Ser. No. 381,230
Claims priority, application South Africa, Jun. 5, 1981, 81/3770
Int. Cl.³ A61J *9/00*
U.S. Cl. 215—11 E **9 Claims**

7. A baby feeding bottle comprising:

a reusable housing of tubular configuration with an open upper end, the housing comprising two longitudinally divided sections which are linked together along a longitudinally extending hinge zone and are movable about the hinge zone between open and closed positions; and cooperating tongue and groove clamp formations located on the two housing sections at low level in the housing, the tongue and groove clamp formations extending longitudinally relative to the housing and being movable relative to each other in a direction transverse to the clamp formations about the longitudinally extending hinge zone between a separated inoperative position when the two housing sections are in open position and an operative position when the two housing sections are in their closed position; an open-ended disposable flexible container including an engagement formation which is spaced from the base of the container and a pair of transversely spaced attachment elements extending longitudinally from the container and securing the engagement formation to a base zone of the container, the attachment elements being separated from each other by an open section and the engagement formation extending transversely between the attachment elements and being separated from the base of the container by said open section, the container



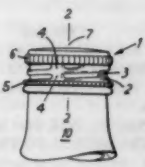
being adapted to be mounted in the housing with the engagement formation of the container clamped between the longitudinally extending tongue and groove formations on the housing to anchor the base of the container and with the mouth zone of the container folded over the open upper end of the housing when the two housing sections are in their closed position, the longitudinally extending attachment elements being adapted at least to minimize distortion of the container when the engagement formation is engaged by the tongue and groove formations; and a teat located on the upper end of the housing, and forming a seal over the mouth of the container.

4,466,548

CONTAINER AND CLOSURE AND METHOD FOR APPLYING A CLOSURE TO A CONTAINER

James F. Herbert, Staffordshire, England, assignor to Metal Closures Limited, England

PCT No. PCT/GB82/00073, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/03059, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 5, 1982, Ser. No. 432,952
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—307 **4 Claims**



1. A combination of a container having an externally screw-threaded neck and a metal closure cap formed from a cup-shaped blank, having a plain cylindrical wall, in which thread is formed, the container being sealed by a gasket within said cap, pressed down against the mouth of said container, said closure being secured to said container by means of separate, longitudinally aligned, inwardly projecting lengths of thread formed by inwardly deforming said plain cylindrical wall

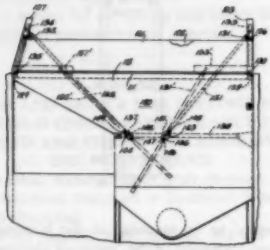
between adjacent turns of the container thread, said inwardly projecting aligned lengths of thread being separated at intervals by undeformed portions of said plain cylindrical wall, such interruptions constituting transverse notches in said closure thread to allow passage of gas transversely of said closure thread.

4,466,549

HARVESTER GRAIN BIN WITH FOLDABLE EXTENSIONS

Roger D. Hanaway, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 16, 1982, Ser. No. 418,693
Int. Cl.³ B65D 7/24
U.S. Cl. 220—4 A **7 Claims**



1. A harvester grain bin having
a front wall,
a rear wall,
a pair of laterally opposite side walls interconnecting said front and rear walls, the upper ends of said walls each presenting a rim of predetermined horizontal width, said rims being substantially coplanar and defining an upwardly facing quadrilateral opening,
front and rear upright extensions pivotally connected at their lower inboard edges on transverse horizontal axes to the inboard edges of said front and rear walls, respectively, said front and rear extensions being pivotable from extended upright positions downwardly and inwardly to at least to a generally horizontal position,
laterally opposite side extensions having their lower outboard edges pivotally connected on longitudinal axes to outboard edges of said rims of said laterally opposite side walls, respectively, said side extensions being pivotable from extended upright positions downwardly to positions alongside the laterally outer sides of said side walls, and
releasable fastening means interconnecting adjacent ends of said extensions at the four corners formed by the extensions in their extended upright positions.

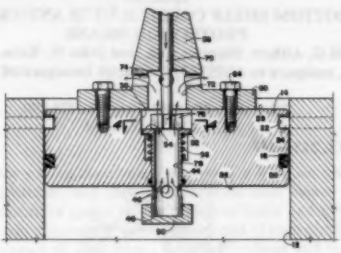
4,466,550

CLOSURE FOR A CYLINDRICAL OPENING HAVING IMPROVED VENTING MEANS

James B. Sullivan, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Sep. 28, 1982, Ser. No. 426,116
Int. Cl.³ B65D 51/16; F16K 24/04
U.S. Cl. 220—206 **4 Claims**

1. A closure for a cylindrical opening having improved venting means, comprising:
a plug body having an inner end and an outer end, the plug body being of cylindrical external configuration for removeable positioning within a cylindrical opening, the plug body having means on the external cylindrical surface to seal against a cylindrical opening wall;
means for retaining the plug body within a cylindrical opening against fluid pressure, the plug body having an axial opening therethrough, a portion of the opening communicating with the plug body outer end being of a larger internal diameter than the portion of the opening communicating with the plug body inner end forming an internal circumferential ledge;
a tubular valve element slidably received in said plug body axial opening, the valve element having an enlarged external diameter portion adjacent the outer end and having at least one radial opening in the tubular wall adjacent to and spaced from the element inner end;
a cap member closing said tubular valve element inner end;
an annular groove within said plug body axial opening adjacent said plug body inner end;



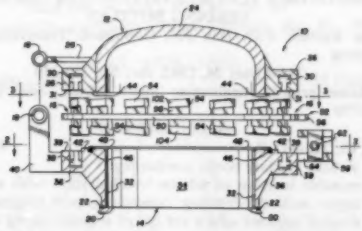
a gasket, such as an O-ring, in said groove slideably and sealably engaging said valve element external cylindrical surface; and
a coiled spring receiving said valve element and compressibly positioned between said plug body opening circumferential ledge and said valve element enlarged external diameter portion which urges said valve element outer end towards said plug body outer end to cause said gasket to engage said valve element between said radial opening and said inner end to thereby close fluid flow through the valve element, the valve element being inwardly depressible by force applied against said outer end to expose said radial opening past said plug body inner end to allow the flow of fluid therethrough.

4,466,551

CLOSURE DEVICE

Kam F. Leung, P.O. Box 127, Little Elm, Tex. 75068

Filed Feb. 28, 1983, Ser. No. 470,308
Int. Cl.³ B65D 87/06
U.S. Cl. 220—293 **24 Claims**



1. A closure device comprising two opposed surfaces adapted to be brought into abutting relation to each other, each surface further comprising a locking groove; a locking ring disposed between said surfaces, said locking ring further comprising a plurality of circumferentially spaced locking lugs, said locking lugs being adapted to provide frictional engagement with said locking grooves when said locking ring is

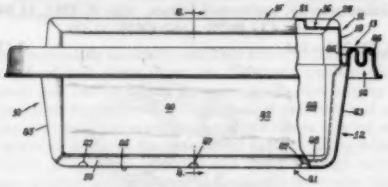
rotated, thereby bringing said surfaces into abutting relation to each other; and means for rotating said locking ring and said locking lugs relative to said locking grooves to provide said frictional engagement.

4,466,552

STERILIZATION CONTAINER FORMED OF NONWOVEN MATERIAL

George A. M. Butterworth, Wilbraham, Mass.; William M. Evans, Mundelein, and Howard J. Goldner, Highland Park, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 8, 1983, Ser. No. 520,992
Int. Cl.³ B65D *43/06*
U.S. Cl. 220—354 **17 Claims**



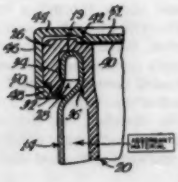
1. A sterilization container capable of withstanding steam sterilization without substantal change in physical properties comprising: a cover of nonwoven material and including a top, a plurality of sidewalls depending from said top, and a seal flange extending about the periphery of said cover side walls; and a tray of nonwoven material and including a bottom, a plurality of side walls extending upwardly of said bottom, and a seal flange extending about the periphery of said tray side walls; said sealing flanges of said cover and tray defining correspondingly curved paths in directions outward of their respective side walls and cooperating to form a continuous seal and define a tortuous path for providing a bacterial barrier when said cover and tray are assembled.

4,466,553

COMPOSITE CONTAINER CONSTRUCTION

Richard D. Zenger, Downers Grove, Ill., assignor to National Can Corporation, Chicago, Ill.

Division of Ser. No. 144,545, Apr. 28, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 299,982
Int. Cl.³ B65D *25/18, 51/20*
U.S. Cl. 220—461 **3 Claims**



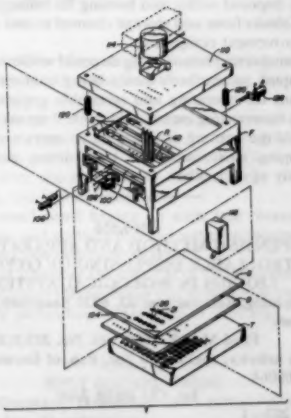
1. A container for packaging a product comprising: an outer container having a bottom wall and a sidewall with an open top and a rim around said open top; a collapsible inner liner loosely positioned within said outer container and forming a space therebetween, said inner liner having an open end substantially aligned with said open end of said outer container to permit filling of said liner with said product during which said liner conforms to said outer container; a rigid ring around the open end of the inner liner and defining a downwardly-opening channel receiving said rim with said liner supported by said rigid ring to secure said liner to said outer container while allowing said liner to flex to change the volumetric capacity of said inner liner; said rigid ring having a locking rib engaging an inner lower portion of said rim and a locking ledge engaging a lower outer portion of said rim to provide a lock for said ring to said rim and seal adjacent said open end of said space between said liner and said container, a cover liner sealed to said rigid ring for sealing said open end of said inner liner after insertion of said product, said rigid ring having an annular recess for receiving a peripheral portion of said cover liner, an overcap releasably secured to said rigid ring and having a peripheral portion engaging said cover liner in said annular recess to clamp said cover liner to said rigid ring, means for venting said space between said outer container and inner liner as said inner liner contracts due to a vacuum therein, thereby preventing the formation of a vacuum in said outer container, and means for hermetically sealing said means for venting after said product has been processed.

4,466,554

SINGULATING SEEDER FOR HIGH DENSITY PLUG TRAYS

William A. Hanacek, and Paul Bickel, both of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Filed Apr. 1, 1982, Ser. No. 364,577
Int. Cl.³ B65H *3/00*
U.S. Cl. 221—1 **5 Claims**



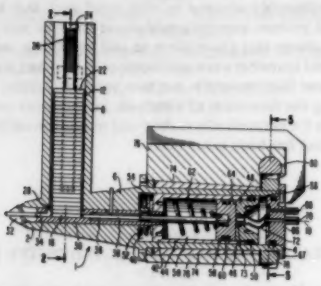
4. In a seed singulator for singulating seed from an unsingulated quantity thereof wherein said seeds include an ellipsoid of revolution generated about a major axis and having a minor axis, an improved singulator comprising: an underlying drop plate with at least one drop hole, said drop hole having a diameter in the range on one-quarter larger than the major axis of the ellipsoid of revolution of said seed; an overlying and reciprocating singulating plate with at least one singulating cell therein, said singulating cell movable to and from a position of registration with said drop hole, a wiper bar overlying said drop hole and capturing said singulating plate therebetween for permitting reciprocating movement of said singulating plate to and from a position of registration of said singulating cell and said drop hole, said wiper bar having an aperture overlying said drop hole; a probe partially penetrating said wiper bar aperture; means for moving said singulating cell into registry between said wiper bar aperture and drop hole; and means for reciprocating said probe downwardly and beyond said drop hole to expel singulated seed.

4,466,555

JIG FOR USE IN MACHINING STYLUS BLANKS

Yashaya Yarnitsky, and Avinoam Livny, both of Haifa, Israel, assignors to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1981, Ser. No. 285,613
Int. Cl.³ B65H 5/00
U.S. Cl. 221—224 15 Claims



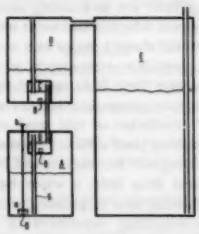
1. In a jig for use in machining blanks including
a housing having a front end and a storage channel,
a releasable gripping means supported by said housing for gripping and releasing blanks transported to the front end of the housing from said storage channel, and
means disposed within said housing for transporting individual blanks from said storage channel to said front end, the improvement comprising:
said transporting means being disposed within said releasable gripping means, both means being connected to control means for operating said releasable gripping means and said transporting means, said control means being located inside the housing and adapted to operate said releasable gripping means and said transporting means independently of each other.

4,466,556

DISPENSING METHOD AND APPARATUS FOR CONTROLLABLE DISPENSING OF OXYGEN AND LIQUIDS IN BIOLOGICAL SYSTEMS

Klaus Söchting, Keltenstrasse 33, 8029 Sauerlach, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,910
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3109064
Int. Cl.³ B67B 7/00
U.S. Cl. 222—1 17 Claims



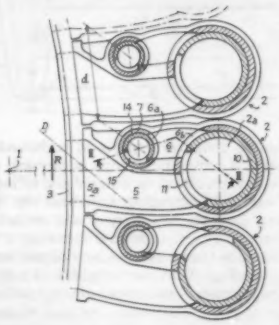
1. A method for continuous release of oxygen or liquid over a prolonged period of time, comprising:
(a) producing water and oxygen in a first container by continuous catalytic decomposition of a hydrogen peroxide solution;
(b) using the oxygen so produced as a drive gas to force the hydrogen peroxide solution from the first container into at least one further container containing a catalyst;
(c) further continuously catalytically decomposing the hydrogen peroxide solution in said at least one further container; and
(d) utilizing the evolved oxygen from the final one of said at least one further container.

4,466,557

DEVICES FOR MEASURING THE QUANTITY OF PRODUCTS FOR CANNING

Yves Marchadour, Ker an Heol 80 route du Chaperon, St Evarzec, 29000 Quimper, and Jean-Charles Marchadour, La feuillerais Kerbascol, St Jean Trolimon, 29120 Pont l'Abbe, both of France

Filed Mar. 2, 1982, Ser. No. 353,921
Claims priority, application France, Mar. 4, 1981, 81 04350
Int. Cl.³ B67D 5/60; G01F 11/00
U.S. Cl. 222—144 7 Claims



1. In apparatus for measuring the quantity of Products for canning; a supply tank to contain the products for canning, a quantity-measuring chamber with a substantially vertical axis, a support mounting said chamber for rotation in a predetermined direction about an axis substantially parallel to the axis of said chamber, said chamber comprising a tubular enclosure, a piston vertically reciprocal within said tubular enclosure, said chamber having a lower portion, a supply conduit communicating said lower portion of the chamber with the supply tank, a vertical cylindrical filling nozzle with a secondary piston reciprocal therein, a delivery conduit extending between the chamber and the nozzle, said delivery conduit communicating with said chamber through an orifice and communicating with said nozzle through a lateral opening entirely situated above the orifice by which said conduit communicates with said chamber, valve means controlling communication between the supply conduit and the measuring chamber, said nozzle being situated between the tank and the chamber and relatively forward of the chamber with respect to the direction of rotation of the chamber, said delivery conduit extending substantially radially, said supply conduit having a part, adjacent said tank, rearwardly inclined with respect to the direction of rotation.

4,466,558

AERATOR CONTROL ARRANGEMENT

Richard H. Dugge, St. Louis County, and Dallas W. Rollins, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 32,579, Apr. 23, 1979, abandoned, which is a division of Ser. No. 545,260, Jan. 29, 1975, Pat. No. 4,165,820. This application Aug. 2, 1982, Ser. No. 407,846
Int. Cl.³ B65G 3/12
U.S. Cl. 222—195 12 Claims

1. A railway hopper car comprising: a plurality of hoppers

spaced longitudinally along said car; each of said hoppers having slope sheets at the lower portion thereof extending downwardly to define a discharge opening; a discharge outlet mounted so as to be movable between open and closed positions relative to said discharge opening; each of said hoppers adapted to contain a particulate granular lading not significantly affected by fluidization, which when loading into said hoppers results in severe bridging directly above said outlet; at least one gas accumulator mounted upon said car; means for periodically pressurizing said accumulator; at least one selectively positionable manually rotatable elbow mounted upon at least one of said slope sheets on the lower portion thereof adjacent said outlet; means for periodically discharging said accumulator; means for directing blasts of gas from said accumulator through said manually rotatable elbow toward selective positions adjacent the outlet until bridged lading adjacent the outlet is rendered flowable and flows through said discharge opening, and whereby said manual elbow may then be rotated to direct blasts of gas to other portions of the hopper to break up additional bridged lading.

4,466,559

VALVES FOR CONTROLLING DISPENSATION OF FLUID MATERIAL

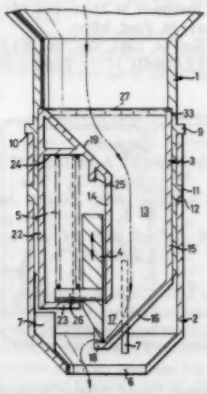
Brian K. Loader, 97 Pams Way, Ewell, Surrey KT19 0HN, England

Filed Aug. 18, 1981, Ser. No. 294,069

Claims priority, application United Kingdom, Apr. 29, 1981, 8113175

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—196 **7 Claims**



1. A valve for controlling the dispensation of powdered material from a reservoir, said valve including a valve body comprising:

a conduit for substantially vertical disposition in use and terminating in an aperture;

blade means having a lower edge, said blade means being formed of ferromagnetic material and magnetically reciprocatable along a linear path in a vertical plane between an open position substantially clear of said aperture and a closed position obturating a vertical aperture,

a valve seat disposed at a lower side of said vertical aperture within said conduit to abut the lower edge of said blade means when it is in the closed position and

guide and shielding means housing said blade means and guiding its vertical sliding motion therewithin while simultaneously shielding all portions of said blade means other than that obturating the aperture from substantial contact with the powdered material.

4,466,560

HAND TOOLS FOR DISPENSING PARTICULATE MATTER

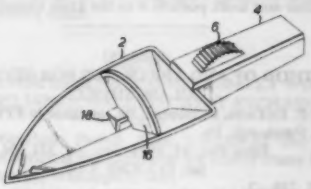
Frank Boram, 1 Chaucer Dr., Milford-on-Sea, Hampshire, England

Filed Sep. 27, 1982, Ser. No. 424,511

Claims priority, application United Kingdom, Oct. 17, 1981, 8131368

Int. Cl.³ B65G *65/48*

U.S. Cl. 222—196 **4 Claims**



1. A hand tool for dispensing particulate matter including

a scoop comprising a handle and a housing having a discharge end,

a labyrinth barrier disposed transversely across the housing defining an upstream reservoir in the housing for particulate matter and defining a labyrinth path for particulate matter from the reservoir to the discharge end of the housing, said barrier comprising

an apertured panel having on each face thereof a wall portion, said portions together with the apertured panel defining said labyrinth passage,

means for vibrating the contents of the reservoir, and

means adjacent the discharge end of the scoop for separating the particulate matter prior to discharge.

4,466,561

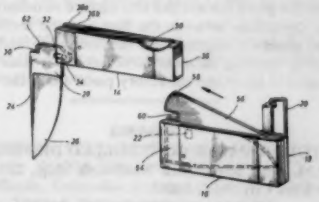
BELT BUCKLE KNIFE

Richard L. Slaughter, Texarkana, Ark., assignor to Slaughter Knife Co., Inc., Texarkana, Ark.

Filed Jun. 18, 1982, Ser. No. 389,620

Int. Cl.³ A45C *15/00*

U.S. Cl. 224—163 **6 Claims**



1. A belt buckle knife having in combination a knife portion removably accommodated by a buckle portion, said belt buckle knife comprising:

a buckle portion having first and second buckle face elements

cooperating to define a blade receiving region, said buckle portion being adapted to engage and fasten a belt;

a knife portion having a handle member and a blade member selectively operable between (i) a knife closed position in which said blade member is engaged by said blade receiving region of the buckle portion and said knife portion is securely attached to said buckle portion, and (ii) a knife open position in which said blade member is locked open relative to said handle member and said knife portion is removable from said buckle portion, said handle member including first and second handle face elements; and

structure to securely attach said knife portion to said buckle portion, said structure including:

locking arm structure included in said handle member of said knife portion and having a detent, said locking arm structure and said first and second handle face elements defining a slot-like region; and

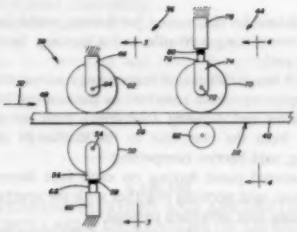
handle receiving structure included on said buckle portion and having a handle receiving recess, said handle receiving structure being accommodated by said slot-like region with said handle receiving recess engaging said detent when said knife portion is in the knife closed position.

4,466,562

METHOD OF AND APPARATUS FOR SEVERING A GLASS SHEET

Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 15, 1981, Ser. No. 331,104
Int. Cl.³ B26F *3/00*
U.S. Cl. 225—2 **16 Claims**



1. A method of severing a piece of refractory material having a first surface and a second opposed surface, comprising the steps of:

imposing a first score in the piece, the first score not extending to either surface of the piece and being within the body of the piece at a location between the first surface of the piece and the centerline of the piece between the first and second surfaces; followed by

imposing a second score in the piece, the second score being generated in the second surface of the piece and extending into the piece toward the first surface terminating short of the centerline between the first and the second surfaces and generally aligned with the first score; and

applying bending moment forces about at least one of the scores to sever the refractory piece along the scores.

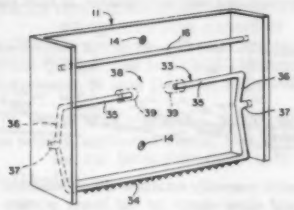
4,466,563

TOILET PAPER CONTROLLED DISPENSER

Sidney M. Zuss, Room 3615 Woolworth Bldg., 233 Broadway, New York City, N.Y. 10007

Filed Feb. 1, 1982, Ser. No. 344,883
Int. Cl.³ A47K *10/36*
U.S. Cl. 225—74 **3 Claims**

1. A toilet paper controlled dispenser, comprising in combination a U-shaped base having a web and spaced flanges for being rigidly affixed vertically to a wall, and a member pivotally supported within said base, said member including a serrated lower cutting edge around which toilet paper, pulled from a roll, is torn off, after being passed downward behind a rear of said pivotable member, said member having an upper edge for holding said pulled paper against said base when said member is pivoted by pulling said paper against said serrated edge during a tearing operation, said member being pivotally



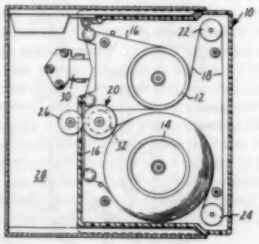
mounted on said flanges wherein said member comprises a wire loop having opposing arms adapted to press against said paper when pivoted, a lower parallel leg with serrations and intermediable stub shafts extending laterally outward into said flanges including a pair of side ends connecting said arms with said lower serrated leg.

4,466,564

BELT FOR BELT-DRIVEN RECORDING TAPE PACK

David P. Smith, North Hudson, Wis., and Robert A. von Behren, Lilydale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 14, 1981, Ser. No. 301,642
Int. Cl.³ B65H *17/34*; F16G *5/00*
U.S. Cl. 226—170 **7 Claims**



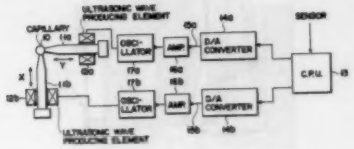
1. A thin, continuous, elastic, flexible, pretensioned belt for a belt-driven recording tape pack, wherein pressure is exerted by the belt on the tape pack over an extended area, and arises solely from the tension in the belt, wherein in the improvement, the belt is characterized by a microscopically rough surface having discontinuities ranging in size between 0.2 and 40 micrometers peak to peak, such discontinuities not being discernable by the naked eye and which extend over substantially the full length of the face which contacts the tape pack to promote the release of air from between the belt and the underlying tape.

4,466,565

WIRE BONDING APPARATUS FOR SEMICONDUCTOR DEVICE

Kenzi Miyazima, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 24, 1982, Ser. No. 423,091
Claims priority, application Japan, Sep. 25, 1981, 56-150769
Int. Cl.³ B23K 1/06
U.S. Cl. 228—1 B 2 Claims



1. A wire bonding apparatus for a semiconductor device, comprising:

a plurality of oscillators;

a plurality of ultrasonic wave energy supplying means each including an ultrasonic wave producing element for producing an amount of ultrasonic wave energy corresponding to the output of said oscillator and an ultrasonic horn driven by the output of said ultrasonic wave producing element to oscillate in a prescribed direction;

a capillary for bonding a bonding wire by means of ultrasonic bonding onto an inner lead of a lead frame and onto a corresponding pad of a semiconductor pellet loaded on said lead frame;

means for inputting location data representative of said inner lead and corresponding pad;

coupling means for coupling said ultrasonic horns of said plurality of ultrasonic wave energy supplying means to said capillary so as to permit one of said ultrasonic horns to define a prescribed angle with respect to the other;

means for determining an angle of bonding in response to said inner lead location data and said corresponding pad location data, said angle of bonding being defined as the angle formed by said bonding wire and a predetermined reference axis; and

means for driving said oscillators so that the amounts of ultrasonic energy supplied to said ultrasonic horns may be varied relative to each other in accordance with said angle of bonding.

4,466,566

METHOD OF FORMING A THIN WALLED ANNULAR CHANNEL

William K. Good, Pontiac, Mich., assignor to Koppy Corporation, Ferndale, Mich.

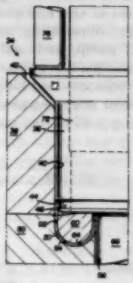
Filed Aug. 26, 1981, Ser. No. 296,410
Int. Cl.³ B23K 31/02
U.S. Cl. 228—155 5 Claims

1. A method of forming a thin walled semi-toroidal shell, generally U-shaped in cross-section, comprising the steps of:

(a) forming a flat rectilinear sheet having free end portions and top and bottom edges into a cylindrical band with said free end portions abutting and said top and bottom edges forming the top and bottom ends of said cylindrical band;

(b) joining said abutting end portions;

(c) forcing one end of said cylindrical band into a semi-toroidal space defined between die members having opposed concave and conve., generally evenly spaced matching fixed die surfaces and an opening at the radial outer extent of said semi-toroidal space, the nominal diameter of said cylindrical band equal to the radial outer opening of said toroidal space, including engaging the opposed end of said cylindrical band, forcing said band between said fixed die surfaces, said die surfaces thereby progressively curling said band radially inwardly between said concave and convex die surfaces in said semi-toroidal space, compressing said cylindrical band and the junction between said



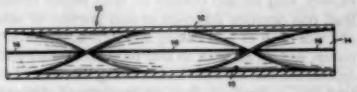
abutting ends, thereby forming said cylindrical band into a semi-toroidal shape.

4,466,567

METHOD FOR BRAZE-JOINING SPIRALLY WOUND TAPES TO INNER WALLS OF HEAT EXCHANGER TUBES

Melton E. Garrison, Powell, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 3, 1982, Ser. No. 414,545
Int. Cl.³ B23K 31/02
U.S. Cl. 228—183 4 Claims



1. In the art of fabricating a heat exchange structure formed of a tube containing therein an elongated convoluted tape having peripheral surfaces thereof disposed in a contiguous relationship with and attached to an inner wall surface of the tube, the method for brazing the convoluted tape to the inner wall of the tape comprising the steps of:

providing the convoluted tape with an elongated wire of brazing filler metal coextensive with the tape at a location contiguous with the radially innermost surface of the tape, inserting the tape and wire disposed thereon into the tube;

sufficiently heating the tube and tape to melt the filler metal and effect displacement of the filler metal to the peripheral edges of the tape by capillary attraction and thereby effect contact of the filler metal with the inner wall surface of the tube; and

thereafter terminating the heating to solidify the filler metal to effect the joining of the tape to the tube over the common length thereof.

4,466,568

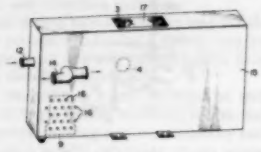
COMBUSTION TYPE HEATER FOR AUTOMOTIVE ROOM HEATING SYSTEM

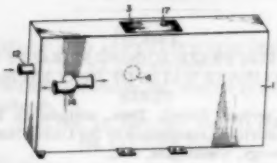
Noritoshi Handa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 10, 1982, Ser. No. 416,567
Claims priority, application Japan, Oct. 26, 1981, 56-171195
Int. Cl.³ B60H 1/02
U.S. Cl. 237—12.3 C 6 Claims

1. A combustion type heater for an automotive interior space heating system, comprising:

a combustor;
an air blower for feeding air to said combustor;
a heat exchanger for heating an automotive interior space heating medium with combustion gas resulting from combustion of a mixture of said fuel and air in said combustor;
a box-like casing accommodating said combustor, said air blower, said fuel pump, and said heat exchanger, said box-like casing having a top wall and at least one side wall having a portion adjacent said fuel pump;
a first outside air inlet port means comprising an opening disposed in said top wall of said casing and an air path to





said blower for permitting air to enter said blower through said casing; and
a second outside air inlet means for providing air to said blower, said second outside air inlet means comprising at least one opening disposed in said portion of said at least one side wall of said casing which is adjacent to said fuel pump, and an air path to said blower, said air path of said second outside air inlet means being directed at and along said fuel pump such that air introduced through said at least one opening is made to impinge upon said fuel pump and flow along the peripheral surface thereof and into said air blower.

4,466,569

ANCHORING A RAILWAY RAIL-FASTENING CLIP TO A FOUNDATION FOR A RAILWAY RAIL

Howard P. J. Taylor, Grantham, England, assignor to Pandrol Limited, London, England

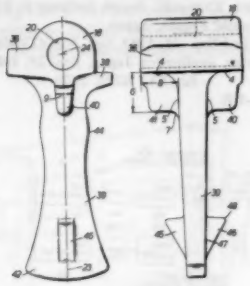
Filed Oct. 15, 1981, Ser. No. 311,636

Claims priority, application United Kingdom, Oct. 15, 1980, 8033257

Int. Cl.³ E01B 9/30

U.S. Cl. 238—1 **18 Claims**

1. An anchoring device which is suitable for use in anchoring a railway rail-fastening clip to a foundation for a railway rail, the device comprising, when considered while in a particular orientation: a head part which is to lie above the foundation; portions of the head part defining a horizontal straight passageway in the head part, into which can be driven a substantially straight and horizontal leg of a railway rail-fastening clip which has been made by bending a metal rod; a tail part which is joined to the head part and is to lie in the foundation and is in the form of a single vertical rod below the head part; a vane, for resisting forces tending to turn the anchoring device about a vertical axis, joined along its upper extremity to the bottom of the head part and joined along one side thereof to one side of the upper portion of the tail part, the vane having an overall vertical height and an overall horizontal width which are both greater than its average horizontal thickness and the vane having a median vertical plane to which the length direction of the passageway is parallel; and a projection, for resisting forces tending to pull the anchoring device vertically out of the foundation, projecting laterally from the tail



part at a location lower than the vane, the top of the projection extending, from the root of the projection towards its tip, at, at most, a small angle to the horizontal.

4,466,570

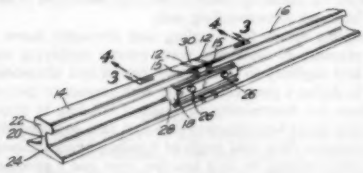
MULTI-SEGMENT ELECTRICALLY INSULATED RAIL JOINT

James T. Howard, Jamaica, N.Y., assignor to New York City Transit Authority, Brooklyn, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,997

Int. Cl.³ E01B 11/54, 11/58

U.S. Cl. 238—153 **10 Claims**



1. An insulated joint for electrically insulating a space between two juxtaposed sections of rail, said joint comprising:
first and second electrically non-conductive end posts disposed in the space between said rails;
a metallic separator disposed intermediate said end posts, said metallic separator including an upstanding web having a top and a bottom and further including a head and a base rigidly connected respectively to said web top and bottom; and
joint bar means rigidly joining said sections of rails, said joint bar means being electrically insulated from said sections of rail, said joint bar means including at least one notch, said separator head extending into said notch and contacting said joint bar at said notch thereby reducing the possibility of said separator failing.

4,466,571

HIGH-PRESSURE LIQUID INJECTION SYSTEM

Reinhard Mühlbauer, Theresien strasse 6, 8057 Eching, Fed. Rep. of Germany

Filed Jun. 22, 1982, Ser. No. 390,961

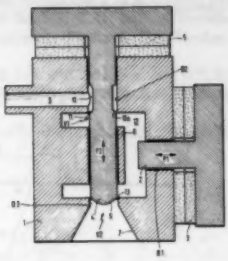
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124854

Int. Cl.³ B05B 1/08

U.S. Cl. 239—101 **13 Claims**

1. A high-pressure injection system for pumping liquids and atomizing them by means of ultrasonic energy, more in particular a fuel injection system for diesel engines, characterized in

that said injection system is constructed as a structural unit of the positively controlled plunger pump type comprising a pump housing which defines a pumping chamber completely filled with liquid, a suction valve and a discharge valve as well as a plunger extending into said pumping chamber, and in that



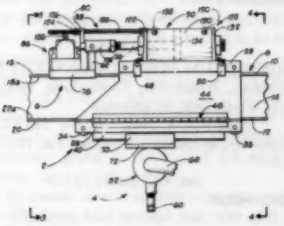
the valve members of said suction valve and said discharge valve as well as said plunger are coupled to ultrasonic vibrators which are operable in a controlled manner for the purpose of causing liquid to be drawn in through said suction valve and to be ejected via said discharge valve.

4,466,572

FLUID-JETTING APPARATUS

Robert Q. Shelton, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 30, 1982, Ser. No. 413,022
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—186 **15 Claims**



1. A fluid-jetting apparatus incrementally movable along a support member, comprising:

carriage means for mounting on the support member, said carriage means including:

a framework defining a channel for receiving the support member, said framework comprising:

a side member movable between an open position in which said framework can be mounted on or dismounted from the support member and a closed position in which said framework is prevented from being mounted on or dismounted from the support member; and

a roller for engaging a surface of the support member when said framework is mounted thereon;

actuator means for mounting on the support member;

fluid ejection means associated with said carriage means, said fluid ejection means including:

a nozzle; and

means for slidably and rotatably connecting said nozzle to said framework;

drive means for operating said apparatus in a plurality of cycles, each cycle having one phase during which said carriage means is maintained stationary relative to the support member and said actuator member is moved relative to the support member and each cycle having another phase during which said actuator member is maintained stationary relative to the support member and said carriage means is moved relative to the support member, said drive means including:

first brake means associated with said carriage means;

second brake means associated with said actuator means;

adjustable spacer means for establishing an incremental distance said carriage means is movable along the support member during each of said cycles;

movement means for effecting relative movement between said carriage means and said actuator means; and

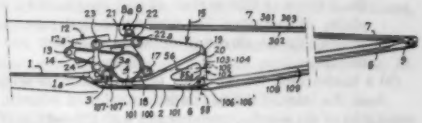
control means for controlling the operation of said first brake means, said second brake means, and said movement means.

4,466,573

WET PIPE DEVICE FOR TURBOJET ENGINES

AndréA. M. L. Camboulives, Savigny Sur Orge, and Gérard M. F. Mandet, Epinay Sous Senart, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation ("S.N.E.C.M.A."), France

Continuation of Ser. No. 226,086, Jan. 19, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 508,415
Claims priority, application France, Jan. 25, 1980, 80 01814
Int. Cl.³ B64C *15/06*
U.S. Cl. 239—265.41 **9 Claims**



1. A jet pipe device for a turbojet engine having an annular stationary canal structure defining a passage for gaseous fluids wherein the device comprises:

(a) an annular support ring attached to the stationary canal structure so as to prevent relative movement therebetween in a direction parallel to a longitudinal axis of the turbojet engine, the annular support ring attached so as to be coaxial with the stationary canal structure;

(b) a plurality of convergent flaps pivotally attached to the annular support ring such that they define an annular convergent flap assembly, each of the convergent flaps having a free end which is movable in a generally radial direction toward and away from the longitduinal axis of the turbojet engine to constrict or expand the passage for the gaseous fluids;

(c) a plurality of control means connected between the convergent flaps and the annular support ring to selectively cause each convergent flap to pivot abouts its attachment to the annular support ring and move its free end toward or away from the longitudinal axis of the turbojet engine wherein each control means comprises:

(i) a force generating element having a first stationary part attached to the annular support ring and a second part extendable and retractable with respect to the first part, the second part having a distal end;

(ii) a rocking lever pivotally attached to the annular support ring and having a first bearing surface;

(iii) connecting means connecting the distal end of the second part to the rocking lever; and,

(iv) a second bearing surface on the convergent flap which contacts the first bearing surface on the rocking lever such that, as the second part extends and retracts with respect to the first part, the rocking lever pivots, thereby causing the convergent flap to pivot about its attachment to the annular support ring; and,

(d) synchronizing means interconnecting each control means such that all of the convergent flaps move at the same time in the same direction.

4,466,574

COOLING APPARATUS

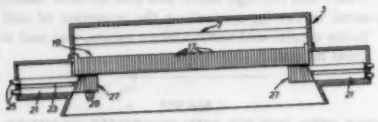
John C. Dobson, Sheffield, and Thomas Hope, Doncaster, both of England, assignors to Davy McKee Limited, Yorkshire, England

Filed Apr. 12, 1982, Ser. No. 367,350

Claims priority, application United Kingdom, Apr. 13, 1981, 8111533

Int. Cl.³ B05B *1/04*

U.S. Cl. 239—455 **9 Claims**



1. A cooling apparatus for supplying a continuous curtain of cooling liquid comprising:

(a) a nozzle having

(i) an inlet being in elongate generally rectangular form,

(ii) an outlet being in elongate generally rectangular form and having a considerably narrower cross-section area than said inlet,

(iii) an intermediate portion located between said inlet and the outlet and containing division means for dividing the interior of that portion of said nozzle into a multiplicity of individual but contiguous first passages extending in the direction between said inlet and said outlet,

(b) a header tank for receiving liquid coolant, in which at least the inlet of the nozzle is located, and wherein said outlet of the nozzle communicates with the outside of said header tank, and

(c) a slider displaceable beneath said first passages from one end of the nozzle to close off those of the first passages beneath which it extends, and means positioned at the inward end of the slider which provides a group of individual but contiguous second passages which serve as extensions to those of the first passages below which they are positioned, and those of said second passages which are positioned adjacent to the slider having their outlet ends inclined outwardly with respect to the other second passages.

4,466,575

DEVICE FOR FORMING A RESERVE WINDING ON A BOBBIN TUBE

Gerd Husges, Schwaikheim; Horst Hofer, and W. Gerhard Hoeber, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 122,992

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907296

The portion of the term of this patent subsequent to Apr. 21, 2000, has been disclaimed.

Int. Cl.³ B65H *54/02*

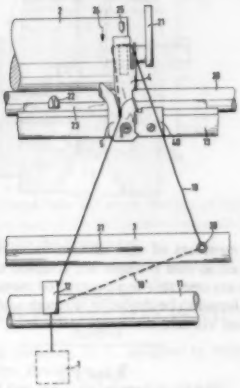
U.S. Cl. 242—18 PW **14 Claims**

1. Apparatus for use with textile machinery for forming a reserve winding on a bobbin tube in a region outside a traversing path of a main thread guide which moves to and fro adjacent a length of the bobbin tube wherein the apparatus is of the type which includes a thread holding device disposed in the vicinity of a thread path defined between a thread delivery point and the bobbin tube, an auxiliary thread guide disposed between the bobbin tube and thread holding device having two deflecting guides between which the thread can be guided parallel to the surface of the bobbin tube, and a thread catching projection disposed on the bobbin tube for projecting between the two deflecting guides and oriented in the direction of rotation of the bobbin tube, wherein the improvement comprisis:

a support carried adjacent said bobbin tube;

said auxilairy thread guide being rigidly connected to said support;

a movable thread guide carried adjacent said auxiliary guide on a side opposite said bobbin tube;



a fork-like free end carried on said movable thread guide facing towards said deflecting guides of said auxiliary thread guide; and

said fork-like free end being movable to move the thread section engaged thereby into the region of said traversing main thread guide.

4,466,576

METERING DRUM FOR FILAMENTARY MATERIAL

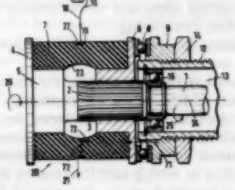
Dionizy Simson, Winterthur, Switzerland, assignor to Sulzer Brothers, Winterthur, Switzerland

Filed Feb. 3, 1982, Ser. No. 345,422

Claims priority, application European Pat. Off., Mar. 9, 1981, 81810087.7

Int. Cl.³ B65H *51/20*

U.S. Cl. 242—47.01 **1 Claim**



1. A metering drum for a filamentary material having a circumferential surface for receiving at least one winding of filamentary material thereon, at least a part of said surface being elastic for varying of the circumferential dimension thereof, a drive shaft, a first supporting ring fixedly mounted on said drive shaft, a second supporting ring movably mounted on said drive shaft with said elastic part disposed between said rings, a fixed cylinder concentric to said shaft and having an external thread, a bearing rotatably mounting said shaft in said cylinder, a third ring threaded on said cylinder and a bearing between said second ring and said third ring whereby threading of said third ring on said cylinder adjusts said second ring

relative to said first ring for changing the diameter of said elastic part.

4,466,577

PROCESS AND APPARATUS FOR FEEDING SUCCESSIVE WEBS OF PACKAGING MATERIAL

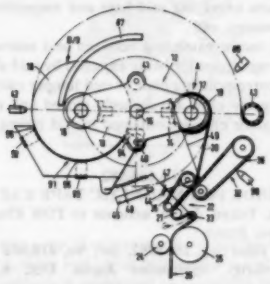
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,501

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3026995

Int. Cl.³ B65H *19/00, 19/06, 19/10*

U.S. Cl. 242—58 **29 Claims**



1. A process for supplying webs of packaging material (20) from a plurality of supply reels (18, 19) to a packaging machine, comprising the steps of:

severing a first web (20) being fed to said packaging machine from a first emptying reel (19) by a first conveyor (35) to form a first trailing web end (34) which is to be fed to said packaging machine;

drawing a second leading web end (33) from a second web (20) wrapped on a full second reel (18) off said second reel with a second suction conveyor (36) having one end overlapping an end of said first conveyor and defining therewith a common plane of movement for said first and second webs;

introducing by means of said suction conveyor said second web end (33) from said second reel into said common plane of movement such that said first and second web ends are spaced apart and do not overlap one another; and

supplying said second web end to said packaging machine.

4,466,578

WINDING MACHINE

Kiyoshi Shibuya, Chiba; Hiroshi Shimanaka, Funabashi, and Yoshiaki Tanaami, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Kawasaki Seitetsu Kabushiki Kaisha, both of, Japan

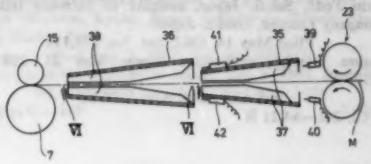
Filed Jul. 6, 1982, Ser. No. 395,624

Claims priority, application Japan, Jul. 8, 1981, 56-106612; Nov. 27, 1981, 56-176421

Int. Cl.³ B65H *17/08, 17/32, 19/28*

U.S. Cl. 242—65 **3 Claims**

1. A winding machine comprising a rotatable winding drum which is movable in a direction parallel to a direction of movement of a very thin metallic sheet, a drive roll for rotating the winding drum by a frictional force, characterized by first and second hollow frames each having guide plates for the sheet in the form of a concave comb facing said sheet and disposed transversely with respect to the direction of movement of said sheet, said plates being disposed so that their longitudinal direction is in parallel to the direction of movement of the sheet, and air nozzles for blowing of air into the hollow frames in the same direction as the direction of movement of the sheet,



whereby the speed of air flow at each side of the sheet is greater than the air flow at the central portion thereof.

4,466,579

CASSETTE FOR ROLLS OF PHOTOSENSITIVE MATERIAL

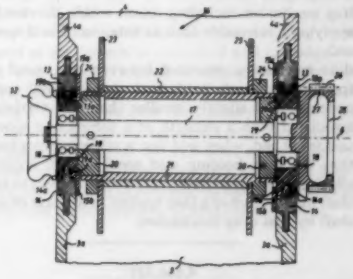
Wilhelm Nitsch, Munich, and Erich Nagel, Anzing, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,212

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150495

Int. Cl.³ B65H *17/02, 23/06*

U.S. Cl. 242—67.1 R **31 Claims**



1. A container for photosensitive material, particularly rolls of photographic paper, comprising:

(a) a housing for accomodating a length of the photosensitive material in wound form, said housing having an aperture for introduction of the photosensitive material therein and withdrawal of the same therefrom;

(b) a rotatable element on said housing for winding and unwinding the photosensitive material;

(c) braking means for braking rotation of said rotatable element; and

(d) clutch means arranged to permit braking of said rotatable element upon rotation of the latter in a first direction and to prevent braking of said rotatable element upon rotation of the same in an opposite second direction, said clutch means including a freewheeling clutch which is coupled to and at least partly circumscribes said rotatable element, and said braking means comprising cooperating braking portions on said freewheeling clutch and said housing which at least partly circumscribe said freewheeling clutch.

4,466,580

FISHING REEL

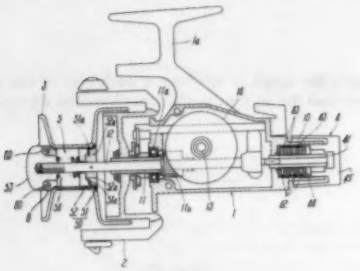
Junichi Toda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 14, 1982, Ser. No. 378,112

Claims priority, application Japan, May 27, 1981, 56-78677[U]

Int. Cl.³ A01K *89/01, 89/02*

U.S. Cl. 242—84.21 R **7 Claims**



1. A fishing reel comprising:

a reel body;

a rotary frame supported rotatably to said reel body;

a drive mechanism for driving said rotary frame;

a spool shaft supported to said reel body in a manner permitting it to be movable longitudinally of said reel body and rotatable;

a spool supported to said spool shaft at the front portion thereof, said spool being supported rotatably with respect to said spool shaft;

a drag mechanism including means within the reel body for applying a selectable load to rotation of said spool shaft; and

a slide mechanism provided between said spool and said spool shaft which holds said spool to said spool shaft under a load slightly smaller than the maximum load associated with a strength of a fishing line wound onto said spool and, when said line is subjected to a load larger than the load holding said spool, which automatically allows said spool to freely rotate with respect to said spool shaft irrespective of a load applied to rotation of said spool shaft by said drag mechanism.

4,466,581

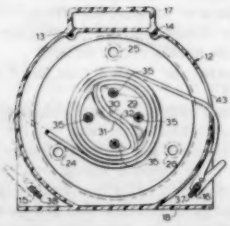
CABLE HOLDER

John O. Hill, 208 Cherrie Ave., Sherwood, Ark. 72116

Filed Feb. 15, 1983, Ser. No. 466,524

Int. Cl.³ B65H *75/40*

U.S. Cl. 242—96 **4 Claims**



1. A portable reel-in device for jumper cables having alligator-type clips on both ends of each cable comprising:

a casing having a flat base,

a first annular housing section being mounted for rotation relative to said casing and having a central hub portions,

a second annular housing section mounted for rotation relative to said casing and having a second central hub portion,

said two central hub portions having engageable portions arranged to engage each other in locked relation while provided a groove therebetween into which central portions of the cables can be received in tight engagement,

securing means locking said two hub portions together,

means defining openings on opposite sides of said casing for directing said cables into and out of the interior of said casing,

a pair of opposed, parallel extending sidewalls in said casing disposed between said annular housing sections and said base at each opposite side of said casing for defining storage spaces overlying said base and respectively beneath said openings, and

anchoring means extending between said sidewalls of each said storage space for being engaged by said alligator clips on the corresponding ends of said jumper cables such that said alligator clips are securely stored and residue from said alligator clips is contained in said casing.

4,466,582

TAPE GUIDE FOR MAGNETIC TAPE CARTRIDGE

Haruo Shiba, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,602

Claims priority, application Japan, Oct. 6, 1981, 56-147747[U]

Int. Cl.³ G03B *1/04;* **G11B** *15/32;* **B65H** *23/04*

U.S. Cl. 242—197 **9 Claims**

1. A tape guide for a magnetic tape cartridge, which comprises:

a main body of said tape guide made of a synthetic resin material, said tape guide main body having a multitude of finely depressed and elevated continuous rectangular portions on and around an outer surface thereof; and a metal layer formed on the outer surface of said tape guide main body.

4,466,583

CASSETTE DOOR LATCH

Peter M. Giannis, Arlington Heights, and Don R. Coy, Jr., Palatine, both of Ill., assignors to T/B & H Home Video, Northbrook, Ill.

Filed Aug. 12, 1982, Ser. No. 407,502

Int. Cl.³ G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—198 **25 Claims**

25. A latch for the door of a tape cassette comprising:

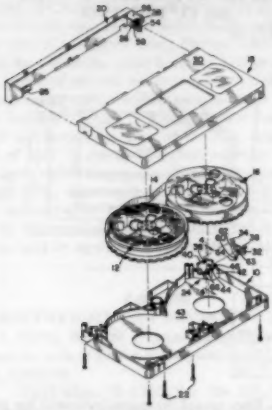
a substantially rigid latching member for latching the door closed;

mounting means for mounting said latching member for rotation about an axis between latching and unlatching positions;

spring means for urging said latching member toward said latching position, said spring means including a resilient arm having one end formed in integral, one-piece relationship to said latching member, said arm projecting from

said latching member in the direction of said rotation toward said unlatching position; and

a pair of projections extending outwardly from said latching member in the direction of said rotation toward said latching position, one of said projections biasing said latching member toward said unlatching position, and the other of said projections is positioned to cooperate with the door to latch the door when the latching member is in said latching position.



4,466,584

APPARATUS FOR COUNTING AND LIMITING THE NUMBER OF PLAYS OF A CASSETTE

Louis Chevalier, Cagnes sur Mer, and Jean Coudert, Nice, both of France, assignors to Check View System S.A., Geneva, Switzerland

Filed Dec. 14, 1981, Ser. No. 330,516

Claims priority, application France, Dec. 12, 1980, 80 26625; Nov. 24, 1981, 81 22204

Int. Cl.³ G11B *23/04, 27/20;* G01D *21/00*

U.S. Cl. 242—199 **7 Claims**

1. In a cassette for a strip of tape or film, comprising a cover and inside the cover a pair of spools on which the strip is wound and unwound; the improvement comprising means for counting the number of times the cassette is played, comprising feeler means adapted to ride on and follow the periphery of at least one of said rolls, and means responsive to movement of the feeler means to register one play of the cassette, said feeler means being mounted on the cover for pivotal movement about an axis parallel to the axes of the spools, a toothed wheel, and a toothed rocking member actuated by the feeler means to swing toward and away from the toothed wheel into and out of engagement with the teeth of the toothed wheel thereby to turn the toothed wheel stepwise upon swinging movement of the feeler means, the position of the toothed wheel counting the number of plays of the cassette.

4,466,585

MAGNETIC RECORDING TAPE CARTRIDGE

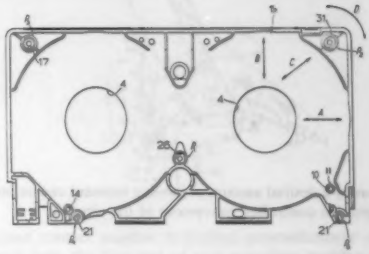
Yoshimi Maehara, Kyoto, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Aug. 3, 1982, Ser. No. 404,717

Claims priority, application Japan, Aug. 8, 1981, 56-117961

Int. Cl.³ G11B *23/04, 15/32;* G03B *1/04*

U.S. Cl. 242—199 **7 Claims**



1. A magnetic recording tape cartridge which comprises in combination:

a bottom section surrounded by peripheral walls and a top section surrounded by peripheral walls assembled together to provide a cartridge case having a chamber for accommodating various components including magnetic recording tape reels on which a magnetic tape is wound;

a first connecting combination of a first hole and a first projection having a lower end portion engagable in said first hole provided at generally the central portion of said cartridge case in one of said bottom and top sections respectively, and

a series of second combinations of connecting members formed at the respective corners of said cartridge case, at least one of said second combinations comprising a stepped through-hole generally oval or elongated in shape having inner side surfaces substantially parallel, in one of said bottom and top sections, and a projection member for engaging said stepped through-hole, in the other of said bottom and top sections, such that an axis of said hole which runs parallel to said side surfaces is directed generally at said central portion of said cartridge case.

4,466,586

DIRECTIONAL CONTROL DEVICE FOR AIRCRAFT

Robert W. Burnham, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

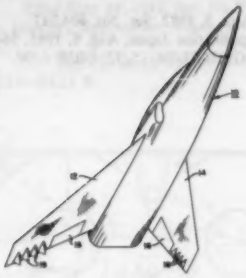
Continuation of Ser. No. 128,780, Mar. 10, 1980, abandoned. This application Dec. 27, 1982, Ser. No. 453,682

Int. Cl.³ B64B *9/34*

U.S. Cl. 244—75 R **5 Claims**

1. In a tail-less aircraft having a wing extending laterally from each side of the fuselage, means for providing side-to-side directional control of the aircraft by generating an appropriately oriented lift force, said means comprising a plurality of retractable airfoil means mounted for movement independently of each other with respect to each wing between a first, retracted, inoperative position, wherein said airfoil means are located in the surface of the respective wing, and a second, extended, operative position, wherein said airfoil means are oriented substantially perpendicular to the respective wing and at the proper angle of attack to produce a lift force acting

substantially parallel to the respective wing, said lift force being generated without generation of substantial drag.



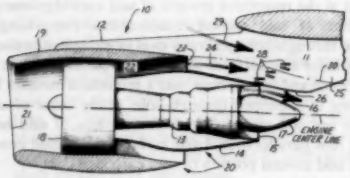
whereby a desired amount of yawing moment can be produced to provide controlled movement of the aircraft.

4,466,587

NACELLE INSTALLATION

Donald J. Dusa, Cincinnati, and Conrad D. Wagenknecht, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 21, 1981, Ser. No. 332,893
Int. Cl.³ B64C 1/38; B64D 29/00
U.S. Cl. 244—121 **3 Claims**



1. In a nacelle installation for a gas turbine engine in an aircraft which includes a core engine and a core cowl which (1) surrounds the core engine (2) defines a core exhaust nozzle for discharging hot exhaust gases, and which includes a fan driven by the core engine, a fan cowl surrounding the fan and defining, together with the core cowl, an annular outlet for discharging bypass air, and which includes a pylon having a trailing portion extending aft of the core exhaust nozzle, wherein the pylon contains a region which is subject to the hot exhaust, wherein a freestream airflow flows generally parallel with the bypass airflow, and wherein an intersection streamline is definable at the intersection of the freestream airflow and the bypass airflow, the improvement comprising:

(a) vortex generators for maintaining a cooling layer of relatively cool air between the relatively hot engine exhaust and the pylon, the vortex generators extending from the pylon and positioned such that

(i) some are located in a supersonic flow region and generate shock waves which increase aerodynamic drag;

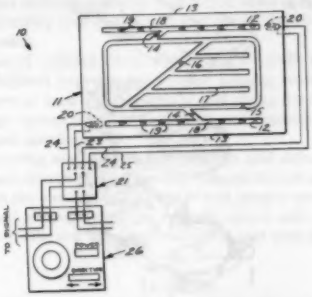
(ii) some are located aft and upward of the exhaust nozzle of the engine for reducing oblique shock waves between the vortex generators and the exhaust nozzle, thereby reducing drag induced by the oblique shock waves.

4,466,588

OPTICAL FIBER TRAVEL DIRECTION INDICATOR FOR MODEL RAILROADS

J. Hal Byers, 206 W. Southcross, San Antonio, Tex. 78221, assignor to J. Hal Byers, San Antonio, Tex.

Filed Jun. 21, 1982, Ser. No. 390,198
Int. Cl.³ B61L 25/08
U.S. Cl. 246—122 A **1 Claim**



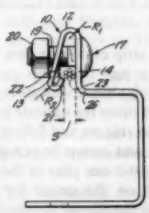
1. An optical fiber travel direction indicator for model railroads, comprising, in combination, a panel, a pattern of cut-outs made in said panel representing a layout of a model railroad, and at least one optical fiber being positioned within a portion of said pattern of cut-outs, said optical fiber comprising an elongated, cylindrical rod, a black enamel coating an entire surface of said rod except at portions of light entry thereinto and light exit therefrom, said light entry comprising one end of said rod and said light exit comprising a plurality of uncoated areas in the shape of arrows along a side of said rod, an electric lamp within said panel being adjacent said rod end, said lamp being in an electric power circuit; and said rod being made from two semi-cylindrically-shaped optical fiber members and an opaque divider strip therebetween, one said member having a row of said arrows all pointing into one direction and the other said member having a row of said arrows all pointing into an opposite direction, a knurled knob on an opposite end of said rod protruding outwardly from an edge of said panel for manual rotation of said rod in order for selective display of said members from the front side of said panel.

4,466,589

CABLE TELEVISION TAP BRACKET OR THE LIKE

Ignazio Leonardo, Mountainside, N.J., assignor to Diamond Communication Products, Inc., Garwood, N.J.

Filed Aug. 24, 1981, Ser. No. 295,730
Int. Cl.³ F16L 3/00
U.S. Cl. 248—61 **16 Claims**



1. As an article of manufacture, a cable clamp for secure attachment to a selected location along a stretch of messenger wire or the like of given effective diameter, said clamp comprising a singlepiece bent stiff metal strip of width to span the

region of locally clamped attachment to the messenger wire or the like, said bent strip integrally defining first and second jaw members connected to each other at an acute angle at first corresponding ends of said members, said jaw members having single transversely aligned apertures intermediate their respective ends, nut-and-bolt means including a shank passing through said apertures for selectively drawing said jaws to each other in reduction of said acute angle, and the other end of at least one of said jaws being formed with an inward reverse-bend lip within the space between said jaws and with the reversely bent end of said lip directed generally toward said first corresponding ends, the clearance between said lip and the other jaw being sufficient to accommodate inserted local reception of the messenger wire or the like, and the reversely bent end of said lip being in offset relation to said shank; whereby upon tightening said nut-and-bolt means, an inserted local length of the messenger wire or the like between said jaw members and between said lip and shank may not only be clamped by and between said jaw members but may also be retained by said lip against separation from said clamp.

4,466,590

LIGHTWEIGHT TILT MOUNTING HEADS

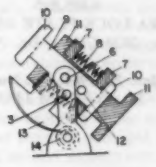
Anthony J. Parks, Bury St Edmunds, and Richard A. Lindsay, Stowmarket, both of England, assignors to W. Vinten Limited, Suffolk, England

Filed Mar. 25, 1982, Ser. No. 361,792

Claims priority, application United Kingdom, Apr. 3, 1981, 8110592

Int. Cl.³ F16M *11/10*

U.S. Cl. 248—185 **7 Claims**



1. A tiltable mounting comprising a base, a tiltable support member pivoted thereto, mounting means on said base for pivotably locating a slide means, said slide means having a retaining means at each end, at least one spring compressible between one of said retaining means and a spring compression means pivotably located on said tiltable support member wherein a line drawn between the pivot of said slide means and the pivot of said base and said tiltable support member is at right angles to the longitudinal centre line of said spring when the pivots of said spring compression means and said slide means are co-axial, and the angular movement of the tiltable support member is twice that of the slide means about their respective pivot points.

4,466,591

BRACKET ELEMENT FOR SUPPORTING HANGING DEVICES

Peter L. Alonzo, 2918 Virginia, McHenry, Ill. 60050

Filed Nov. 16, 1981, Ser. No. 321,803

Int. Cl.³ A47B *96/06*

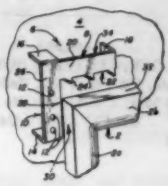
U.S. Cl. 248—217.1 **1 Claim**

1. A one piece bracket element for supporting curtain rods, window shades and other hanging devices from a frame means attached to an adjacent structure, said bracket element comprising:

a grappling member adapted to releasably engage the horizontal edge of an upper corner portion of such frame means;

a base member adapted to rest against the vertical edge of said upper corner portion of such frame means, said base member being rigidly connected at its upper end to one end of said grappling member;

a first contact member extending perpendicularly rearward from the lower end of said base member and adapted to rest against said vertical edge of said upper corner portion of such frame means to facilitate placement and alignment of said bracket element with respect to such frame means and adjacent structure to prevent rotation of the mounted bracket element about the longitudinal axis of said base member;



a second contact member extending perpendicularly rearward from the free end of said grappling member and adapted to rest against said horizontal edge of said upper corner portion of such frame means to facilitate placement and alignment of said bracket element with respect to such frame means and adjacent structure and to prevent rotation of the mounted bracket element about the longitudinal axis of said grappling member;

a third contact member extending perpendicularly rearward from the upper end of said base member; and

receiving means located within a segment of said base member for mounting various types of hanging devices.

4,466,592

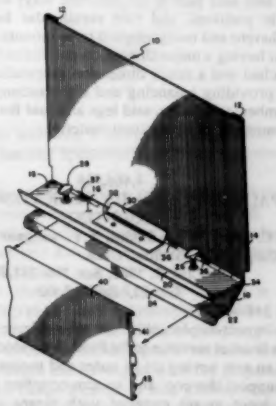
SIGN HOLDER

Kenneth D. Janson, 33 W. Grand Ave., Old Orchard Beach, Me. 04064

Filed May 24, 1982, Ser. No. 381,362

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—225.1 **8 Claims**



1. A sign holder for positioning in the price tag molding of a case, comprising:

a sign base member;

means to hold a sign to said sign base member;

an upper retention member having a first side and a second side;

a lower retention member having a first side and a second side;

means to hold the first side of said upper retention member, the first side of said lower retention member and bottom of said base member in rotatable relation to one another;

means to hold the second side of said upper retention member and the second side of said lower retention member to said price tag molding; and

means for urging said sign base member to an upright position when said device is installed while allowing said sign base member to be rotated downward at various desired times.

4,466,593

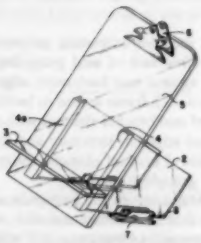
COPYHOLDER, LECTERN, BOOK SUPPORT

Clayton P. Odenath, 108 Peach Rd., Bellmawr, N.J. 08031

Filed Mar. 2, 1981, Ser. No. 239,349

Int. Cl.³ A47G *1/24*

U.S. Cl. 248—455 **4 Claims**



1. A device for use as a copyholder, lectern, book support or the like comprised of a rectangular back support member with a clip for holding documents of various size and nature, said clip being mounted in a horizontal position at the top front of said support member; a ledge for holding books of various size and nature mounted at the bottom front of said support member in a horizontal position, said ledge being perpendicular to said support member; two parallel rails mounted in a vertical position on the back of said support member; two quadrilateral legs of non-isosceles trapezoidal configuration adapted to be inserted into said rails in six different ways to form different adjustable positions, and two rectangular feet having rails affixed thereto and being adapted to be mounted onto said legs, each foot having a major dimension parallel to the leg to which it is attached and a minor dimension perpendicular to said leg thereby providing balancing and stabilization; said back support member, said ledge, said legs and said feet being substantially comprised of transparent material.

4,466,594

IMPACT-DISPLACEABLE REAR VIEW MIRROR MOUNTING

Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

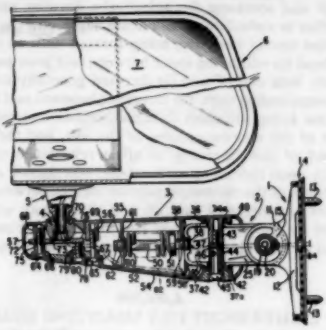
Filed Jul. 9, 1981, Ser. No. 281,581

Int. Cl.³ B60R *1/02*

U.S. Cl. 248—484 **7 Claims**

1. An impact-displaceable rear view mirror mounting comprising a bracket member to be fixed to a vehicle body or door surface, an arm having on its outer end means for mounting a mirror support thereon, and an arm coupling member having thereon inner means engaged with means on said bracket member and outer means engaged with means on the inner end of said arm for normally holding said arm protruded outward from said coupling member yet yieldably holding said arm so that it is displaceable by a force against said outer end in either direction about a substantially vertical axis at said coupling member,

said bracket member comprising a base portion having a post protruding therefrom, said coupling member comprising inner end portions disposed at and clampable against opposite sides of said post, said end portions and said sides having thereon mating elements which are interengaged so as to prevent relative movement of said members when



said end portions are clamped against said post and which, when said end portions are not so clamped, permit said coupling member to be turned about a substantially horizontal axis to an angle of protrusion from said base portion suited to the slope of a said body or door surface.

4,466,595

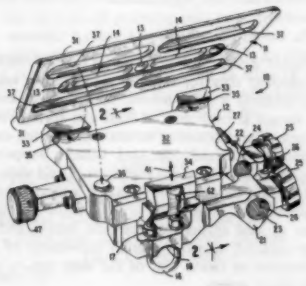
CAMERA LOCK-PLATE ASSEMBLY

Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

Filed Jun. 22, 1981, Ser. No. 275,811

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—558 **6 Claims**



1. An instrument lock-plate assembly comprising, in combination, an elongated base plate adapted for being rigidly secured to the base of an instrument and having parallel tapered ways, a support body having an upper surface for receiving said base plate and opposed lugs with undercut surfaces to engage said tapered ways and define a tongue-in-groove mating engagement between said base plate and said support body, the lug on one side of said upper surface being movable with respect to said body and mounted for movement both down to the plane of the upper surface and above said upper surface toward the opposed lug, means for biasing said movable lug up from the plane of said upper surface so that said base plate can engage the fixed lugs, press the movable lug against said bias and have the movable lug snap above the adjacent way of the base plate when the plate rests on said upper surface, and means for manually moving said movable lug above said sur-

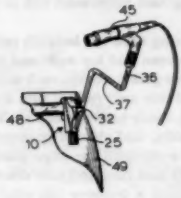
face toward the opposed lug so as to clamp the base plate between said lugs and against said upper surface.

4,466,596

INSTRUMENT ACCESSORY CLAMPING DEVICE

Martin B. Cohen, Hillsdale, N.J., assignor to Latin Percussion, Inc., Garfield, N.J.

Filed Apr. 3, 1981, Ser. No. 250,802
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—635 **4 Claims**



1. A clamping device for releasably mounting an instrument accessory, comprising:

a clamp member having an elongated channel formed therein, a worm shaft rotatably retained in said channel, means for rotating said worm shaft, a movable clamping jaw received on said shaft for reciprocal movement along said channel upon rotation of said shaft, a fixed clamping jaw disposed adjacent to one end of said channel for cooperation with said movable clamping jaw, and a receiving bore and a threaded bore intersecting said receiving bore;

a support arm for supporting an instrument accessory including a vibration-damping collar secured to one end of said support arm and an accessory support member having a knurled sleeve portion mounted in a friction-fit manner on said vibration-damping collar so that said accessory support member together with said instrument accessory may be rotated on said support arm; and

means for adjustably mounting said support arm on said clamp member, including an integral split collar rotatably mounted in said receiving bore of said clamp member and having a bore formed therethrough in which said arm is rotatingly received, and a rotatable control knob having a threaded stem received in said threaded bore for engaging said collar to thereby tighten and loosen said collar to fix or release the rotatable position thereof and to secure or release said support arm received therein.

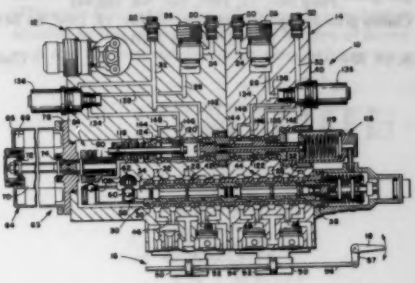
4,466,597

ELECTRO-MECHANICAL DIRECT DRIVE VALVE SERVO SYSTEM WITH ROTARY TO LINEAR VALVE DRIVE MECHANISM

Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Dec. 2, 1981, Ser. No. 326,536
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—130 **30 Claims**

1. A servo system for controlling a fluid output device, comprising a servo valve including a linearly movable valve element for selectively supplying high pressure fluid to the output device to control same, and control input means for operating said servo valve, said control input means including a rotary force motor, a first member rotatably driven by said force motor about a rotational axis, said first member having an axial face inclined to said rotational axis, a second member journaled on said first member for rotation relative to said first member, said second member having an axial face in axial alignment and bearing engagement with said axial face of said first member, a radial arm on said second member, means for restraining said arm for movement in a plane parallel to said rotational axis, means connecting said arm to said valve element for linear movement of said valve element in response to nutating movement of said arm upon rotation of said first



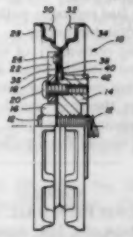
member by said force motor, and auxiliary control means responsive to a control input for initially braking rotation of said first member and then for rotating said first member at a controlled rate to a neutral position.

4,466,598

LOAD LIMITING APPARATUS FOR HOISTS

Cecil H. Eggleton, Fruitport, and William F. Henry, Muskegon, both of Mich., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 3, 1982, Ser. No. 384,807
Int. Cl.³ B66D *3/16*; F16D *7/02*
U.S. Cl. 254—358 **7 Claims**



1. In a hoist including a drive shaft and a drive chain, improved load limiting apparatus comprising a chainwheel that includes:

(a) a hub for mounting on the drive shaft, said hub having an annular recess in an outer periphery thereof;

(b) a generally annular clamping member attached in juxtaposition to said hub forming an annular groove with the recess in said hub; and,

(c) annular chainwheel rim means located in encircling relationship to said hub and clamping member, said chainwheel rim means having an outer periphery including a series of circumferentially spaced recesses for receiving the drive chain and having an inwardly projecting, axially bifurcated flange located in said groove with the bifurcated surfaces of said flange being spaced apart to effect a frictional engagement with said hub and clamping member, whereby said chainwheel rim means, hub and clamping member rotate together until a predetermined torque load is exceeded on said chainwheel at which time said chainwheel rim means moves relative to said hub and clamping member to limit the load imposed on said hoist.

4,466,599

LIFTING DEVICE, IN PARTICULAR, A TACKLE BLOCK

Edouard Singer, 53 Rue de Mulhouse, 68790 Morschwiller-le-Bas, France

Filed Nov. 13, 1981, Ser. No. 320,941
Claims priority, application France, Nov. 19, 1980, 80 24713
Int. Cl.³ B66D *3/10*
U.S. Cl. 254—391 **9 Claims**

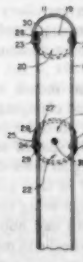
1. A tackle block for use with a cord comprising
a strap having two legs,
a shaft fixedly mounted between said two legs and having a portion extending outwardly of one of said legs,
a pulley mounted for rotation on said shaft between said strap legs,
a first pulley fixedly mounted on said extending portion of said shaft,
a second pulley mounted on said extending portion of said shaft outwardly of said first pulley, said second pulley formed by two cheekplates, one of said cheekplates being slidable along said shaft,
a braking shoe, means for mounting said braking shoe spaced from said rotatable pulley to move slidably relative to said shaft on which said rotatable pulley is mounted to cooperate with said rotatable pulley,
a sheath extending outwardly of said first fixed pulley for guiding the cord therebetween, and
cooperating locking means and guide means on said second fixed pulley for the free strand of the cord, said guide means being separate from and movably mounted with respect to said second fixed pulley.

4,466,600

ROUND PIPE RAIL SYSTEM

John T. Tuttle, Indianapolis, Ind., assignor to Tuttle Aluminum & Bronze, Inc., Noblesville, Ind.

Filed Nov. 15, 1982, Ser. No. 441,438
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—65 **11 Claims**



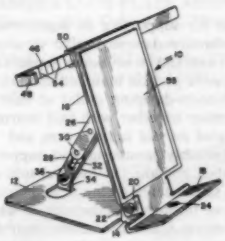
9. A railing system comprising:
a plurality of upstanding tubular posts with bottom ends fixedly mountable at a support base level and top ends located thereabove, each of said posts having a constant outside diameter along its entire length and being of one piece construction along its entire length;
a plurality of horizontally extending rails including an upper most rail having downwardly opening apertures complementary in size and receiving said top ends of said posts, each rail beneath said uppermost rail including pairs of holes complementary in size to and through which said posts vertically extend, each of said rails having a constant outside diameter along its entire length and being of one piece construction along its entire length;
first rivets securing said uppermost rail to said top ends of said posts;
second rivets securing each rail beneath said uppermost rail to said posts between said top ends and said bottom ends;
a plurality of flexible gasket sleeves each slidably mounted to a post and fitted into said rails at said apertures and said holes occupying space between and sealing together said rails and said posts, said sleeves positioned in said apertures including a straight top edge portion perpendicularly arranged to said post and said sleeves positioned in said holes including a concave top edge portion to conformingly fit to said outside diameter of said rails.

4,466,601

HOLDING FIXTURE FOR DRILLING OBLIQUE HOLES

James G. Raines, 11144 Valle Vista Rd., Lakeside, Calif. 92040

Continuation of Ser. No. 375,451, May 6, 1982, abandoned. This application Sep. 23, 1983, Ser. No. 535,204
Int. Cl.³ B23Q *3/00*
U.S. Cl. 269—79 **2 Claims**



1. A holding fixture for holding a work piece in a specific angular relation to a drill for drilling an oblique hole in the work piece, the fixture comprising:
a planar base member attachable to a drill press table;
an upwardly extending work piece support table pivotally attachable at its lower end to said base member for adjustment about a horizontal axis;
adjusting means connectable between said support table and said base member for securely holding said support table at a continuously selectable angle relative to said base member within the range of said adjusting means;
first indicia means on said adjusting means for indicating the selected angle of said support table relative to said base member;
the lower end of said support table having an integrally formed outwardly extending foot plate substantially perpendicular to said support table for supporting a work piece thereon, the foot plate having a substantially central clearance hole permitting passage of a drill through a work piece;
a bar member horizontally slidably mounted on the upper portion of said support table;
said bar member having an outwardly projecting stop, substantially normal to the plane of said support table for engaging a side edge of a work piece mounted on said support table; and

second indicia means on said bar member for indicating the position of said stop relative to said support table and said clearance hole.

4,466,602

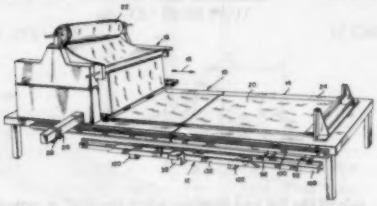
ADJUSTABLE MOTION CONTROL APPARATUS FOR FABRIC SPREADING MACHINES

Conrad A. Costigan, Richmond Hill, N.Y., assignor to Spreading Machine Exchange, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,993

Int. Cl.³ B65H *29/46*

U.S. Cl. 270—31 **10 Claims**



1. An adjustable motion control apparatus for a fabric spreading machine assembly which includes a table and a carriage which is driven back and forth along said table to deposit layers of fabric upon the surface of said table and is guided by a guide track extending along one longitudinal edge of said table, said carriage mounting a first switch which slows the motion of said carriage and a second switch which reverses the direction of motion of the carriage, said adjustable motion control apparatus comprising:

an auxiliary track sized to extend along substantially the entire length of said table,

track mounting means securing said auxiliary track means to said table with said auxiliary track extending parallel to said guide track and being spaced therefrom,

an elongated rail member positioned to engage and actuate said first switch,

rail mounting means for adjustably mounting said rail member on said second track means for movement to selected positions thereon,

locking means for locking said rail member to said second track means, and

cam block means adjustably mounted on said rail means for actuation of said second switch.

4,466,603

METHODS AND APPARATUS FOR PRODUCING STACKS OF SHEETS

Gerhard Schnell, Neuffen, Fed. Rep. of Germany, assignor to bielomatik Leuze GmbH + Co., Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,070

Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018987

Int. Cl.³ B65H *39/075*

U.S. Cl. 270—58 **7 Claims**

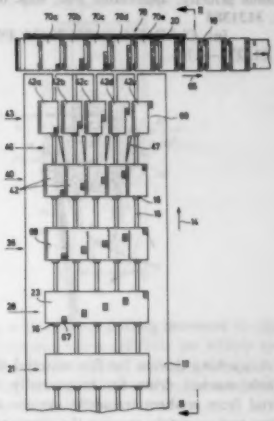
1. An apparatus for producing and conveying indexed stacks of sheets, processed from layers of wide stock, comprising:

cutting means for successively severing the stock lengthwise to produce parallel rows of side-by-side batches of layers, the layers having lengthwise binding edges and index edges opposite one another and parallel to a conveying direction;

lengthwise conveying means for conveying the parallel rows of batches of layers in the conveying direction;

spacing means disposed downstream of the cutting means for spacing the batches of layers in each row apart from one another in a direction transverse to the conveying direction;

index-punching means disposed downstream of the spacing means and having a row of adjustable punches for simultaneously removing parts of at least one of the lengthwise index edges of the layers in at least some of the batches in each row without damaging the lengthwise binding edges of layers in adjacent but spaced batches, the punches being adjusted so that at least some of the batches of layers in each row are punched differently from adjacent batches



of layers in the same row by the index-punching means; and,

transverse conveying means, adapted for incremental stepped conveying, disposed downstream of the index-punching means, for receiving the spaced, differently-punched batches of layers and for producing stacks of indexed sheets from the batches of layers in each row as the conveyor steps from one end of each row to the other.

4,466,604

ELEVATOR TYPE PAPER FEEDING APPARATUS

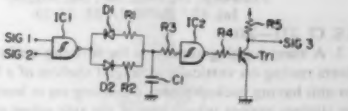
Tadao Kishimoto, Hachioji, and Takao Tsuda, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,391

Claims priority, application Japan, Oct. 24, 1980, 55-152899[U]

Int. Cl.³ B65H *7/08*

U.S. Cl. 271—111 **2 Claims**



1. In an elevator type paper feeding apparatus,

first detecting means for generating a signal upon detecting the existence of transfer paper on a tray,

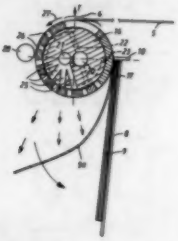
second detecting means for generating a signal upon detecting that a door is closed, and

a detecting circuit for generating an output signal indicating permissability of copying following the lapse of a prescribed period of time (T1) after receipt of the signals from said first and second detecting means, wherein T1 is longer than a period of time from a point of time when the presence of paper on the tray is initially detected by said first detecting means to a point of time when the paper reaches a regular feeding position.

4,466,605
STACKING DEVICE FOR SHEET MATERIAL

Karl Leuthold, Munich; Wilhelm Mitzel, Neu-Keferloh, and Markus Haberstroh, Landsberg, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,595
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131388
Int. Cl.³ B65H *29/38, 29/24;* F01H *5/00*
U.S. Cl. 271—177 **11 Claims**



1. A stacking device for flat material sheets comprising: a rotatable stacker drum for tangentially receiving sheets of material from a sheet transport system at a first tangential position and arcuately moving the sheets to a stop at a second tangential position at which a stack is formed; suction supply means having at least one suction opening at a predetermined location on the periphery of said stacker drum for gripping the leading edges of the sheets at said first tangential position and releasing said sheets at said second tangential position; and compressed air supply means including air openings on the periphery of said stacker drum for discharging intermittent blasts of compressed air from said air openings, each of said blasts having a plurality of pulsations alternately increasing and decreasing in magnitude, said air openings being positioned behind said suction opening in the direction of rotation of said stacker drum for applying the pulsating air blasts to the sheets to separate the portions of the sheets trailing the leading edges from the drum.

4,466,606
SHEET JOGGING APPARATUS

Donald L. Snellman, 2807 W. Galer St., Seattle, Wash. 98199, and Bernard A. Pearson, King County, Wash., assignors to Donald L. Snellman, Seattle, Wash.

Filed Sep. 14, 1981, Ser. No. 301,597
Int. Cl.³ B65H *31/38, 31/36*
U.S. Cl. 271—221 **17 Claims**

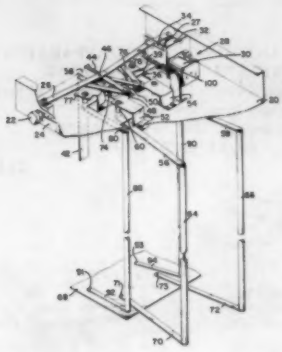
1. A sheet jogging apparatus for forming uniform stacks of sheets resting on vertically arranged shelves of a bin unit, the bin unit having backup means extending on at least one side of the shelves against which one of the side edges of the stacks may be aligned, comprising:

a jogging apparatus including at least one jogging rod mounted on the opposite side of the shelves from the backup means and positioned for movement for contacting and aligning the side edges of the stacks of sheets,

a source of reciprocal motion,

linking means connecting the jogging apparatus to the source of reciprocal motion for movement of the jogging bars to and from the stacks, and

a slidable adjusting means for adjusting the distance between the jogging bars and backup means to accommodate different widths of paper, including an opening along one side of the bin unit and a sliding shaft accessible through the opening and operatively associated with the linking means to move the jogging rod away from the backup means when the shaft is moved in one direction in the opening, wherein the angle of the shaft with respect to the

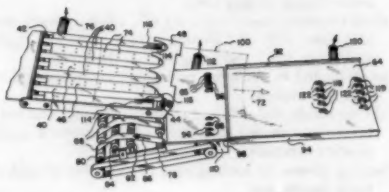


side of the bin unit changes when the shaft is moved in the opening.

4,466,607
SHEET INVERTING DEVICE

Albert R. Clark, McKinney; William A. Ernst, Irving; Svetislav Mitrovich, Dallas, and James E. Self, Richardson, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,422
Int. Cl.³ B65H *5/00*
U.S. Cl. 271—225 **14 Claims**



1. A device for inverting a sheet, comprising:

sheet input transport means for transporting a sheet along an input path,

sheet output transport means for transporting a sheet along an output path in a direction generally opposite to said input path, said output path extending beneath the input path,

means defining a sheet supporting surface intermediate said input and output paths and positioned for receiving a sheet which has been discharged by said sheet input transport means,

sheet retarding roller means mounted on said means defining a sheet supporting surface such that said roller means extends partially through said surface to contact a sheet supported on said surface, said sheet retarding roller means being mounted for rotation in a first direction so as not to inhibit movement of a sheet on said sheet supporting surface toward said output path, while not being mounted for rotation in a second direction, opposite to said first direction, so as to inhibit movement of a sheet on said sheet supporting surface toward said output path,

reversal drive means for engaging a sheet deposited on said surface by said sheet input transport means, and for moving said sheet into engagement with said sheet output transport means, and

deflector means, adjacent said sheet input transport means,

for deflecting a portion of a sheet transported by said sheet input transport means, whereby said sheet is distorted into a nonplanar shape to provide beam strength therefor as said sheet leaves said sheet input transport means.

4,466,608

MOVABLE TRAY SHEET SORTER

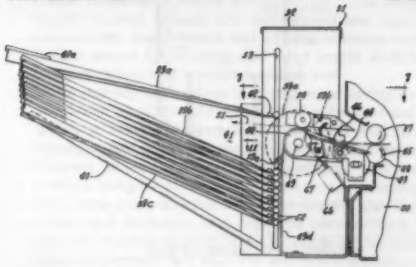
R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco Systems, Inc., Santa Ana, Calif.

Continuation of Ser. No. 146,145, May 2, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,473

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ B65H *39/11*

U.S. Cl. 271—293 **12 Claims**



1. A sorting and collating apparatus for sheets comprising:
a frame,
a plurality of trays disposed in a vertical stack,
a tray support extending from said frame to support the outer end of the lowermost of said trays,
a pair of sidewalls for said frame,
vertically extended slots in said sidewalls,
trunnions on the inner end of each tray and extending through said slots,
a drive shaft supported by said side walls,
a pair of transfer wheels mounted on said drive shaft, externally of said sidewalls, said transfer wheels each having at least one geneva-type slot adapted to engage said trunnions,
means biasing the inner ends of said trays together,
a space defined in said stack by engagement of said trunnions with said transfer wheels between the underside of the inner end of one tray and the upper side of the inner end of another tray,
said transfer wheels constructed and arranged to move a tray upwardly and downwardly as the wheels are rotated in opposite directions and as the slots in the wheels engage the trunnions of the trays and as the trunnions are moved along the slots in the frame, a reversible electric motor connected to said drive shaft, an electric circuit including a sensing switch, said switch connected to the motor whereby to instruct the motor to rotate the transfer wheels after a sheet of paper has passed across the switch.

4,466,609

COMPACT SHEET SORTER

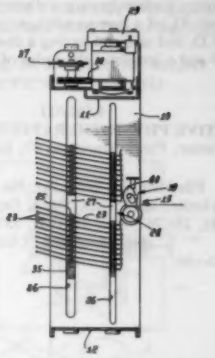
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco Systems, Inc., Santa Ana, Calif.

Filed Apr. 19, 1982, Ser. No. 369,473

Int. Cl.³ B65H *29/58*

U.S. Cl. 271—293 **4 Claims**

1. Sorting apparatus of the shiftable bin type, including a frame structure having means for mounting the apparatus at the sheet outlet from a copying machine, sorting bins mounted at one of their ends in said frame structure and shiftable relative to one another to provide a wide sheet entry between bins, and means for shifting said bins: the improvement wherein said bin shifting means includes pairs of rotary bin shifting members at opposite sides of said bins adjacent said one end, means for rotating said bin shifting members, said bins having pairs of support members at opposite sides thereof adjacent said one



end and engageable with said bin shifting members to support said bins in parallel relation when said bins are widely spaced and engageable with adjacent support members to support said bins in parallel closely spaced relation, the other ends of said bins extending freely from said frame structure.

4,466,610

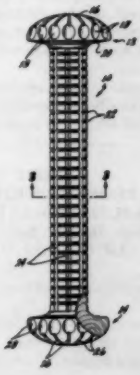
EXERCISE CLUB

Terry P. Israel, 1238 11th St., Apt. 8, Santa Monica, Calif. 90401

Filed Jul. 7, 1981, Ser. No. 281,067

Int. Cl.³ A63B *11/00, 21/00*

U.S. Cl. 272—93 **9 Claims**



1. An exerciser characterized by an elongate cylindrical shaft having at each end a hand grip in the form of an enlarged coaxially mounted disc-like knob, said knob having an outwardly convex end face and a rounded peripheral region, said knob having a pattern of grooves formed therein for providing gripping surface against slippage of the hand both axially and circumferentially, the peripheral region of each hand grip being formed with a plurality of scalloped indentions forming a regular array of concave oval figures thereabout for admitting the inner sides of the fingers from the first joint to the knuckles, said knob having further inwardly a substantially flat facing finger tip gripping surface formed by a wall thereat and

generally curved in a relatively shallow S-shape to accommodate the curve of the finger at the first point at the point of its curvature thereabouts and a lower convex portion for conforming to the shape of the tip of the finger and smoothly contoured into the extent of the rod, said hand grip and said inwardly facing surface having a diameter corresponding to the hand grip, D, of a human adult, an axial thickness of the order of 0.4 D, and said rod having a diameter of the order of about 0.5 D and a length of the order of 3 D.

4,466,611

ACTIVE PHYSIOTHERAPEUTIC DEVICE

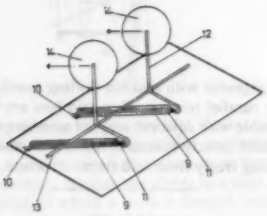
Angel A. Pastor, Paseo Maritimo 37, Edificio Luz, Málaga, Spain

Filed Sep. 21, 1981, Ser. No. 303,936

Claims priority, application Spain, Sep. 26, 1980, 253.173; Jan. 24, 1981, 255.767; Apr. 24, 1981, 257.863

Int. Cl.³ A63B *23/00*

U.S. Cl. 272—96 **3 Claims**



1. Active physiotherapeutic apparatus for the rehabilitation of lower extremities and improving blood circulation, comprising:

a base inclined upwardly towards the user,

two pedals with heel guards mounted to rotate at their lower part on the base,

said pedals being urged upwardly by elastic means whereby said pedals pivot when activated by the user's feet to overcome the resistance of the elastic means and are restored to their initial position when the user's foot stops exerting pressure,

wherein said elastic means comprises a draw spring activated through an elbow-shaped lever ending at its free end in a sheave over which the pedal acts.

4,466,612

ADJUSTABLE RESISTANCE EXERCISING DEVICE

George B. Marczewski, 739 Oakwood Dr., Westmont, Ill. 60559

Filed Nov. 16, 1981, Ser. No. 321,594

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—133 **3 Claims**

1. An adjustable friction resistance exercising device comprising:

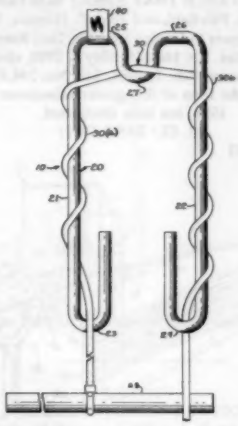
a unitary mandrel contoured to define:

first and second elongated shafts having upper ends and lower ends and adapted to receive several turns of rope thereon;

a head portion joined to the upper ends of the shafts so as to space the shafts apart from each other, the head portion being contoured to define a first shoulder joined to the first shaft, a second shoulder joined to the second shaft, and a U-shaped support loop between the shoulders so that a rope may be supported by the support loop and threaded under each shoulder and then around the shafts to hold a rope on the mandrel;

a first U-shaped open ended guide loop means joined to the lower end of the first shaft and having an opening which faces the head portion and which is situated between the shafts;

a second U-shaped open ended guide loop means joined to the lower end of the second shaft and having an opening which faces the head portion and which is situated between the shafts, wherein the first and second guide loop means are laterally spaced apart from one another so that a rope may pass unopposed between them, whereby a rope may be laid on the support loope such



that one end of a rope may be wrapped around the first shaft and extended over the first guide loop means, and the other end of a rope may be wrapped around the second shaft and extended through the second guide loop means; and

attachment means for joining the first shoulder to a supporting member.

4,466,613

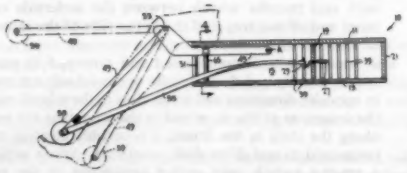
PORTABLE QUADRICEPS EXERCISER

John W. Reese, Gaithersburg, Md., assignor to Biokinetics, Inc., Bethesda, Md.

Filed Mar. 24, 1982, Ser. No. 361,404

Int. Cl.³ A63B *21/02, 21/04*

U.S. Cl. 272—142 **13 Claims**



1. Apparatus for exercising the quadriceps muscle of a patient, said apparatus comprising:

a support member which is sufficiently portable as to be easily and conveniently carried about in one hand by said patient, said support member including: a bottom portion adapted to be supported by a flat support surface; a forward end; and a top surface adapted to support a buttock and the back of a thigh of said patient such that the patient's knee joint extends beyond said forward end;

a pair of bracket members secured to said suppot member to extend longitudinally forward of said forward end in transversely spaced relation on opposite sides of said patient's knee joint;

a pair of substantially parallel transversely-spaced arm members, each pivotally attached to a respective bracket member to define a pivot axis which is substantially co-axially

aligned with the axis of rotation of the knee joint of the patient, said arm members each having a length at least equal to the length of a lower leg portion of the patient;

a cross-piece member extending transversely between said arm members at a location which is spaced from said pivot axis such that it contacts the instep of the patient's foot when the patient's knee joint is aligned with said pivot axis;

elastomeric strap means secured to said arm members and to said support member for elastically resisting pivotal movement of said arm members about said pivot axis in a forward and upward direction;

adjustable means for selectively adjusting the elastic resistance presented by said elastomeric strap means;

wherein said elastomeric strap means includes two lengths of elastic strap, each length having a first point along its length secured to said first and second arm members, respectively, and wherein said adjustable means includes further means for securing said strap length at different locations along said support member; and

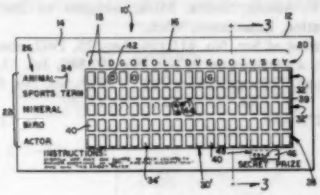
wherein said support member is an enclosure having a cover which can be selectively opened, and a forward end wall which is selectively removable, wherein said bracket members are pivotally mounted inside said enclosure between stowed and deployed positions, said stowed position being such that said bracket members, arm members, cross-piece member and strap lengths are disposed within said disclosure, said deployed position being such that said bracket member projects forwardly beyond said removed forward end wall and said arm members, cross-piece member and straps are located outside said enclosure.

4,466,614

GAME WITH SELECTABLE PLAYING AREAS

Gilbert Bachman, and Gabriel H. Weaver, both of Atlanta, Ga., assignors to Dittler Brothers, Inc., Atlanta, Ga.

Filed Aug. 6, 1982, Ser. No. 406,106
Int. Cl.³ A63F 9/18; G09B 3/08
U.S. Cl. 273—139 **20 Claims**



16. A game comprising:

a playing surface;

first indicia on said playing surface defining a plurality of alphabetical letters;

second indicia on said playing surface defining a plurality of game categories, said second indicia being arranged on said playing surface so that said game letters are in spaced relationship with said game categories;

third indicia on said playing surface defining a plurality of selectable playing areas, each of said playing areas being in spaced register with one of said game letters and one of said game categories so that selection of a particular one of said playing areas associates a particular one of said game letters with a particular one of said game categories; and

a preselected plurality of said playing areas defining at least one predetermined game letter combination which spells a word related to one of said game categories,

whereby the selection of a particular predetermined word for each of said game categories wins the game.

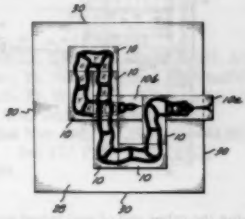
17. The game of claim 16, wherein said plurality of said playing areas define a plurality of game letter combinations which spell a plurality of words, and wherein each one of said plurality of words is related to one of said game categories.

4,466,615

APPARATUS FOR PLAYING GAME

Michael J. Yaeger, P.O. Box 4304, Pioneer Sq. Station, Seattle, Wash. 98104

Filed Aug. 30, 1982, Ser. No. 412,949
Int. Cl.³ A63F 1/00, 9/12
U.S. Cl. 273—292 **7 Claims**



1. An apparatus for playing a game within a defined area of a planar playing surface, said game apparatus comprising:

a lead tile upon which is imprinted a representation of a first end portion of a typically elongate subject;

an end tile upon which is imprinted a representation of a second end portion of the typically elongate subject;

a plurality of body tiles upon each of which is imprinted a representation of a section of a central portion of the subject whose first and second end portions are pictured on the lead and end tiles, said lead, end, and body tiles being adapted for placement on the playing surface adjacent one another in such a manner that the lead, end, and body tiles cooperate to form a complete picture of the subject in a realistic posture, each of said representations being divided into a first segment at a first end of said representation, a second segment at a second end of said representation, and a third segment interposed between said first and second segments, each of said first, second, and third segments on any particular tile being marked with different identifying indicia and said first and second segments being marked with indicia different from one another so that a change in indicia occurs from the first end of the representation of the second end of the representation.

4,466,616

TARGET APPARATUS

Arthur G. Griego; Randy T. Griego, and George A. Griego, Jr., all of 8901 Central NE. Space 3, Albuquerque, N. Mex. 87123

Filed Nov. 30, 1982, Ser. No. 445,666
Int. Cl.³ A63B 63/00
U.S. Cl. 273—384 **21 Claims**

1. A missile responsive amusement apparatus comprising:

a target for receiving the striking of a missile;

a box-like frame;

an elongated target arm having said target rigidly mounted to one end, said target arm being pivotally mounted proximate its other end to said frame;

a latch bar mounted for rotation about its axis upon said frame, said latch bar having a protruding bent arm positioned for engaging the other end of said target arm;

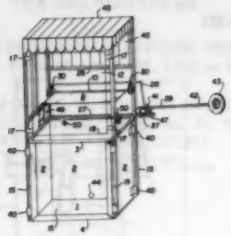
at least one latching tooth rigidly attached to one end of said latch bar;

a spindle bar mounted upon said frame for rotation about its axis in a position parallel and proximate to said latch bar;

at least one latching spindle cam rigidly mounted to one end of said spindle bar proximate said latching tooth, said cam

including latching means for engaging said latching tooth; and

a seat or platform rigidly attached to said spindle bar, said seat being held in an upright position for holding an object in one state of said apparatus via said latching tooth engaging said latching means, whereupon a missile striking said target causes said target to move in a direction for pivotally moving the other end of said target arm in a direction causing rotation of said latch bar via movement of its bent arm for lifting said latching tooth out of engagement with said latching means of said latching spindle cam, thereby permitting said seat to drop downward by gravity via free rotation of said spindle bar, further causing an object initially upon said seat to drop towards the bottom of said apparatus.

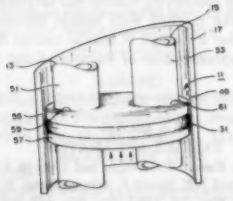


4,466,617

SANDWICH SHAPED PISTON SEAL

James W. Montgomery, Huntsville, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 2, 1983, Ser. No. 500,213
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—4 **6 Claims**



1. A sandwich-shaped piston seal for sealing multiple mandrels within the surrounding cylindrical body of a multiple mandrel well packer, comprising:

a plate shaped center portion made of a compliant elastomer material having upper and lower surfaces and an outer rim, said center portion being provided with multiple holes for receiving said multiple mandrels with said mandrels being generally perpendicular to said upper and lower surfaces;

a pair of external backup rings circumscribing the outer rim of said center portion;

a pair of internal backup rings circumscribing the interior surface of each of said mandrel holes; and

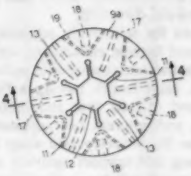
a pair of header plates surrounding said center portion in sandwich fashion, said plates being provided with multiple holes corresponding to said holes in said center portion for receiving said mandrels.

4,466,618

SELF-ADJUSTING SEALING DEVICE FOR CHROMIUM PLATING PLANTS

Sergio Angelini, Milan, Italy, assignor to Brevetti Elettrogalvanici Superfiniture S.R.L., Brugherio, Italy

Filed May 6, 1982, Ser. No. 375,785
Claims priority, application Italy, May 20, 1981, 21844 A/81
Int. Cl.³ F16J *15/18, 15/56;* C25D *7/06*
U.S. Cl. 277—12 **19 Claims**



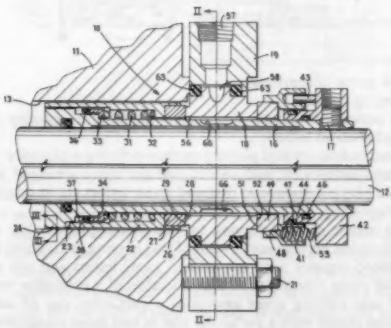
1. A sealing device for continuously chromium-plating tanks for bars and the like, comprising seals in correspondence with apertures for the passage of the bars, on the walls of the chromium-plating tank, in which each seal presents flexible sealing fins, defined by slits having substantially a radial direction, the inner edges of the fins defining a central aperture for passage of the bars, substantially smaller in size than the cross-section of the bars, and in which stiffening spring elements, in the form of leaf springs are arranged around, and oriented towards the aforesaid central aperture in which each seal consists of two sheets of soft plastic material, pressed and welded together, between which are disposed said stiffening elements.

4,466,619

MECHANICAL SEAL ASSEMBLY WITH INTEGRAL PUMPING DEVICE

William V. Adams, Scotts, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 411,194, Aug. 25, 1982, abandoned, which is a continuation of Ser. No. 282,885, Jul. 13, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 499,416
Int. Cl.³ F16J *15/34, 15/40*
U.S. Cl. 277—15 **12 Claims**



1. A mechanical seal construction for sealing a shaft which projects from and is relatively rotatable with respect to a surrounding housing, comprising in combination:

an elongated shaft sleeve nonrotatably and sealingly connectible to said shaft in surrounding relationship thereto;

an annular seal stator disposed in surrounding relationship to said shaft sleeve and being spaced therefrom by a narrow

annular chamber therebetween, said seal stator being nonrotatable with respect to said housing;

said seal stator defining thereon first and second nonrotatable annular seal faces, said first and second seal faces being defined on opposite axial ends of said stator and facing outwardly in opposite directions;

a first seal rotor disposed axially adjacent one side of said stator in surrounding relationship to said shaft sleeve; said seal rotor being nonrotatably fixed to said shaft sleeve and spaced therefrom to define a first annular region therebetween which is in open communication with said annular chamber, and first deformable seal ring means coacting between said shaft sleeve and said first seal rotor for sealingly closing the end of said first annular region;

said first seal rotor having a first rotatable annular seal face formed on one end thereof and maintained in abutting sliding contact with said first nonrotatable seal face;

a second seal rotor disposed axially adjacent the other side of said stator in surrounding relationship to said shaft sleeve, said second seal rotor being nonrotatably fixed to said shaft sleeve and spaced therefrom to define a second annular region therebetween which is in open communication with said annular chamber, and second deformable seal ring means coacting between said shaft sleeve and said second seal rotor for sealingly closing the end of said second annular region;

said second seal rotor having a second rotatable annular seal face formed on one end thereof and maintained in abutting sliding contact with said second nonrotatable seal face; and

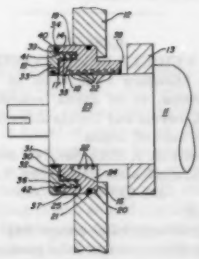
pump means integrally associated with said stator and said shaft sleeve for effecting recirculation of fluid through said annular chamber, said pump means including inlet and outlet passages extending radially through said stator, the inner ends of said passages where they communicate with said annular chamber being directed substantially tangentially with respect to said shaft sleeve, said pump means also including an annular pumping rotor defined by a portion of said shaft sleeve, said pumping rotor being disposed radially directly adjacent the inner ends of said passages and having an irregular annular surface for effecting pumping of the fluid within said annular chamber.

4,466,620

SEALING RINGS

David C. Orlowski, 2901 106th Ave. West, Milan, Ill. 61264

Filed Dec. 27, 1982, Ser. No. 448,186
Int. Cl.³ F16J *15/44*
U.S. Cl. 277—53 **31 Claims**



1. Sealing rings of the type comprising:

a. A first ring member;

b. A second ring member;

c. Said first ring member having an external radially extending face, internal radially extending face, an inner axially extending face, and an outer axially extending face;

d. Said inner axially extending face having a series of internal labyrinth annular grooves and an axially extending groove joining said internal labyrinth annular grooves and opening to said external radially extending face;

e. Said internal radially extending face having an axially extending first annular recess having parallel inwardly radially facing and outwardly radially facing walls;

f. Said second ring member having an axially extending first annular flange having an outwardly facing portion and an inwardly facing portion adapted and constructed to be complementary with said recess;

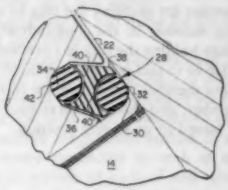
characteristic in that each of said internal labyrinth annular grooves is deeper than its adjacent groove located on the internal radially extending face side with respect thereto.

4,466,621

ROTARY DRILL BIT MULTIPLE SEAL ASSEMBLY

Lloyd L. Garner, Ft. Worth; Samuel R. Westfall, Hurst, and Dwight A. Rife, Ft. Worth, all of Tex., assignors to Rock Bit Industries U.S.A., Inc., Fort Worth, Tex.

Filed Nov. 29, 1982, Ser. No. 445,053
Int. Cl.³ F16J *15/24, 15/38*
U.S. Cl. 277—84 **22 Claims**



1. A rotary seal for utilization with an earth boring drill bit having a drill bit body with a shaft rigidly mounted on a face surface thereof and a rolling cutter rotatably mounted on said shaft, said seal comprising:

a first bearing surface disposed circumferentially about said shaft;

a second bearing surface disposed on said rolling cutter;

a first compressible seal ring having a portion thereof engaged sealingly with first bearing surface;

a second compressible seal ring having a portion thereof engaged sealingly with said second bearing surface; and

a flexible floating ring disposed between and in engagement with said first and second compressible seal rings.

4,466,622

COMPOUND DYNAMIC SEAL FOR ROLLING CUTTER DRILL BIT

John D. Deane, Houston, and Robert J. Kotch, Humble, both of Tex., assignors to Reed Rock Bit Company, Houston, Tex.

Continuation of Ser. No. 171,683, Jul. 24, 1980,. This application Sep. 20, 1982, Ser. No. 419,844
Int. Cl.³ F16J *15/16*
U.S. Cl. 277—92 **6 Claims**

1. A seal assembly for a rotary drill bit of the type comprising a generally cylindrical bearing journal constituting a first bearing member of the bit, and a generally frustoconical roller cutter rotatably mounted on the journal constituting a second bearing member of the bit, the journal and the roller cutter together defining an annular cavity therebetween in the bit, said seal assembly being positioned in the cavity for holding lubricant in the bit, said seal assembly comprising:

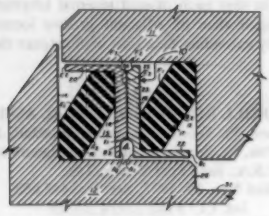
a ring of relatively rigid material in the cavity, the ring being so sized relative to said bearing members as to be movable with respect thereto in the longitudinal axial direction of the bearing members, and having a generally radially extending face constituting a sealing face thereof;

seal means of generally annular configuration in the cavity

between and sealingly engageable with the movable ring and one of the bearing members;

means for biasing the ring to move in the longitudinal axial direction of the bearing members toward the other bearing member to a position in which the sealing face of the ring is in sealing relationship; and

interengageable means, independent of the seal means and



the biasing means, on the movable ring and on said one bearing member for enabling the ring to move along said one bearing member in the longitudinal axial direction thereof, while holding the ring in a predetermined angular position relative to said one bearing member, whereby the other bearing member, upon rotation relative to said one bearing member, also rotates with respect to said movable ring while biased to its sealing position.

4,466,623

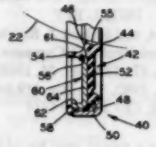
STEERING BALL SEAL

Joseph Antonini, Chicago, Ill., and Frank W. Zawodni, Ft. Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 1, 1983, Ser. No. 500,042

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 **10 Claims**



1. A steering ball seal comprising an annular outer case, an inner case, and an elastomeric sealing member supported by said outer case, said sealing member including at least one sealing lip extending radially inwardly of said outer case; said sealing member further including an axially extending annular protective assembly tab, said tab including an integral radially protruding retention ridge, said sealing member also including an integral retention bead radially outwardly of said retention ridge; said ridge and said bead cooperating to provide for resilient insertion, removal, and retention of said inner case against said sealing member.

4,466,624

SEALING ARRANGEMENT

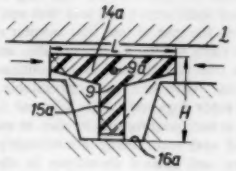
Pier L. Panigati, Lugano, Switzerland, assignor to Etablissement d'Occident, Vaduz, Liechtenstein

Continuation of Ser. No. 917,884, Jun. 22, 1978, abandoned. This application May 6, 1980, Ser. No. 147,238

Claims priority, application Switzerland, Jun. 27, 1977, 7861/77

Int. Cl.³ F16J *15/32, 5/40*

U.S. Cl. 277—171 **6 Claims**



1. In a sealing arrangement for providing a fluid seal beween first and second spaced apart, relatively movable and generally cylindrical bodies, the arrangement being of the type wherein the first of said bodies is provided with a seat having first and second generally radially extending, axially spaced seating surfaces, the arrangement including an annular gasket ring of resilient material having, in its relaxed condition, a predetermined clearance from the second body and annular clearances between the ring and the seating surfaces, said ring having an annular torsinal axis about which the ring can rotate under the pressure influence of fluid passing between the bodies to engage and form a seal with one of the seating surfaces, the improvement wherein

said seating surfaces define a groove dimensioned to loosely receive said gasket ring so that said ring is free to move relative to said bodies,

said gasket ring being formed such that, in cross section, the ring comprises

an axial portion including a first leg extending axially along said second body and spaced therefrom in the relaxed condition outside of said groove; and

a radial portion including at least one second leg attached to and extending generally linearly radially from said the first leg toward the bottom of said groove in said first body such that said torsional axis is contained in said axial portion with most of said second leg in said groove,

and wherein said sealing ring is movable relative to both of said first and second bodies.

4,466,625

ROAD VEHICLE LEVEL CONTROLLER

Kouichi Kondo; Masahiro Ueda, both of Toyota, and Seiji Nonoyama, Kariya, all of Japan, assignors to Aisin Seiki Kabushikaisha, Toyota and Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 5, 1982, Ser. No. 346,325

Claims priority, application Japan, Feb. 9, 1981, 56-17858

Int. Cl.³ B60G *17/00*

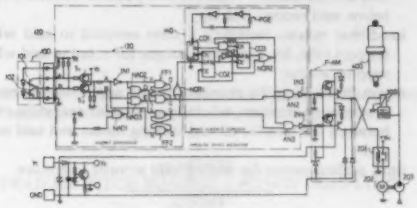
U.S. Cl. 280—6 R **11 Claims**

1. A vehicle level controller comprising:

a vehicle level detector capable of producing a level detection signal indicative of at least four regions of vehicle level including a "high", a "medium high", a "medium low" and a "low" region,

and a vehicle level adjuster comprising a micro-computer operative to determine a particular region of vehicle level in response to the level detection signal, the microcomputer operating to produce a level lowering command signal in response to a signal indicative of vehicle level in the "high" region, to terminate the level lowering com-

mand signal in response to a signal indicative of a level in the "medium low" region, to produce a level raising command signal in response to a signal indicative of a vehicale level in the "low" region and to terminate the level raising command signal in response to a signal indicative of a vehicle level in the "medioum high" region, the microcomputer applying a first signal to a drive system



associated with a suspension system of the vehicle which causes the vehicle level to be lowered for a time interval less than or equal to a period during which the level lowering command signal is present and applying a second signal to the drive system which causes the vehicle level to be raised for a time interval less than or equal to a period during which the level raising command signal is present.

4,466,626

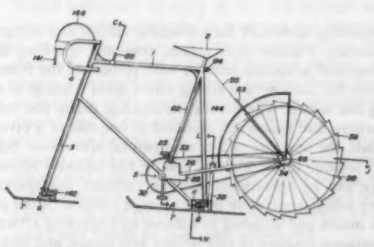
VELOCIPEDE

James P. Leritz, 4210 Balboa St. #202, San Francisco, Calif. 94121

Filed Nov. 25, 1981, Ser. No. 325,030

Int. Cl.³ B62M *29/00*

U.S. Cl. 280—12.14 **6 Claims**



1. A vehicle for travel over ice or snow covered terrain including supporting frame means, and terrain engaging means mounted upon said frame means, steering means for controlling the direction of travel of said vehicle, braking means for slowing said vehicle, traction means for propelling said vehicle upon said terrain, retraction means for moving said traction means into and out of engagement with said terrain, drive means for transmitting power to said traction means to propel said vehicle, said drive means also transmitting motive power to said retraction means for operation thereof, and control means for selectively bringing said retraction means into and out of driving engagement with said drive means, said drive means including a crankshaft and said retraction means being powered by rotation of said crankshaft in a first direction and said retraction means being non-responsive to rotation of said crankshaft in a direction opposite to said first direction, said retraction means preventing movement of said traction means into or out of engagement with said terrain in response to movement of said crankshaft in said opposite direction.

4,466,627

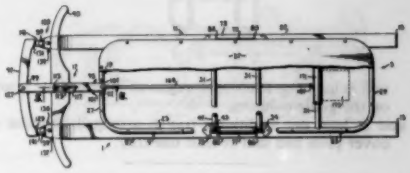
SLED STRUCTURE WITH RUNNER CONNECTING TRANSVERSE LINK

Robert G. Gottlieb, 4809 W. 95th St., Overland Park, Kans. 66207

Continuation-in-part of Ser. No. 280,135, Jul. 2, 1981, abandoned. This application Jan. 15, 1982, Ser. No. 339,742

Int. Cl.³ B62B *13/12*

U.S. Cl. 280—21 A **3 Claims**



1. A sled for traversing a snow covered surface comprising:

(a) an elongate frame having a pair of side frame members extending from each side thereof;

(b) a platform attached to said frame for the positioning of a user of said sled thereon;

(c) a pair of elongate flexible runners each connected to a respective side frame member, each of said runners being pivotally mounted by a pivot member for rotation about a longitudinal axis relative to a respective side frame member near a middle longitudinal portion of said runner;

(d) steering means connected to each of said runners to rotate a front portion of each of said runners about the respective longitudinal axis thereof; and

(e) connecting means positioned between said runners at said respective middle longitudinal portion thereof to urge said middle longitudinal runner portions to rotate about said respective longitudinal axes in concert;

(f) said connecting means comprising a lever arm extending vertically upwardly from each of said runners and non-rotatably associated therewith; and

(g) a transverse link extending between said lever arms and pivotally attached thereto such that rotation of one of said runners about a respective longitudinal axis thereof rotates the other of said runners about the respective longitudinal axis thereof, and including

(h) rotation variation means to vary the amount of rotation of one of said runners relative to the amount of rotation of the other of said runners whereby when turning, an inner runner of said sled rotates more than an outer runner of said sled.

4,466,628

MOBILE CONTAINER

Alfred Zerver, Remscheid, Fed. Rep. of Germany, assignor to Hazet-Werk Hermann Zerver GmbH & Co. K.G., Remscheid, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,622

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045905

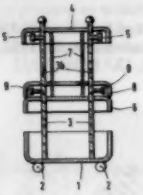
Int. Cl.³ B25H *5/00*

U.S. Cl. 280—47.35 **5 Claims**

1. In a mobile container, particularly for the storing of tools and workpieces, preferably in automobile repair shops, having a container bottom part provided with wheels and on which at least two guide columns are arranged for the supporting of a cover plate displaceable thereon which can be fixed in an uppermost position thereof by means of a locking device and which is connected via flexible pull elements with at least one tray in such a manner that when the cover plate is fastened in the uppermost position said tray is lifted, the improvement comprising

at least one additional tray displaceably mounted on the guide columns,

means comprising an additional locking device for securing



said at least one additional tray in an intermediate position on the guide columns,

said at least one additional tray is arranged between said cover plate and said at least one tray.

4,466,629

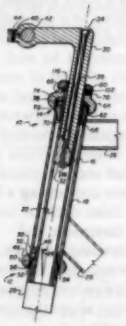
BICYCLE HEADSET INCLUDING A STEM SEAL

Michael W. Sinyard, 844 Jury Ct., San Jose, Calif. 95112

Continuation-in-part of Ser. No. 397,589, Jul. 12, 1982,. This application Jun. 16, 1983, Ser. No. 504,870

Int. Cl.³ B62K *21/06*

U.S. Cl. 280—279 **7 Claims**



1. A headset for use in steering a single wheel of a multi-wheeled vehicle, such as a bicycle, comprising:

a head tube, fixedly attached to said vehicle in an approximately vertical orientation, having an open cavity therethrough that is bounded by an upper end and a lower end;

wheel support means for rotatably coupling said single wheel to said vehicle, said wheel support means comprising a wheel support tube positioned in said open cavity and protruding through said upper end of said head tube, and also comprising a shoulder located below said lower end of said head tube;

lower bearing means for rotatably coupling said wheel support means to said head tube, said lower bearing means comprising a lower cup coupled to said lower end of said head tube, a crown cone coupled to said shoulder of said wheel support means and forming a first annular chamber between said lower cup and said crown cone, a first bearing located within said first annular chamber for transferring a portion of the weight of said vehicle from said lower cup to said crown cone, and first sealing means coupled to said crown cone for sealing said first annular chamber at a position exterior to said first bearing;

upper bearing means for rotatably coupling said wheel support means to said head tube, said upper bearing means comprising an upper stationary cone coupled to said upper end of said head tube and having a perforation therethrough allowing said wheel support tube to protrude through said upper stationary cone, an upper cup coupled to the portion of said wheel support tube that protrudes through said upper stationary cone and forming a second annular chamber between said upper stationary cone and said upper cup, a second bearing located within said second annular chamber for rotatably coupling said upper stationary cone and said upper cup, and second sealing means coupled to said upper stationary cone for sealing said second annular chamber at a position exterior to and below said second bearing;

handlebar means, including a stem coupled to said wheel support tube, for applying a torque for rotating said wheel support means;

means for locking the elements of said upper bearing means in operating position, whereby an annular aperature exists between the interior of said locking means and said stem; and

third sealing means for sealing said annular aperature.

4,466,630

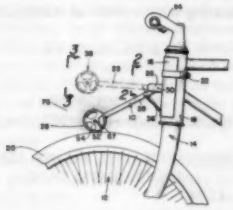
BICYCLE SPARK WHEEL

Larry C. Larkin, 6938 E. Newton Pl., Tulsa, Okla. 74115

Filed Sep. 13, 1982, Ser. No. 417,143

Int. Cl.³ B62J *5/08*

U.S. Cl. 280—289 D **5 Claims**



1. A sparking accessory for a wheeled vehicle and comprising stationary friction disc means, rotatable sparking disc means disposed in spaced relation with respect to the friction disc means for creating a sparking effect upon rotation of the sparking disc means, wherein the friction disc means and rotatable sparking disc means are mounted at one end of a pivotal arm means, the opposite end of said pivotal arm means being pivotally secured to the wheeled vehicle and movable between a storage and an operational position therefor, the sparking accessory being inoperative in the storage position of the pivotal arm means and actuated to achieve said sparking effect in the operational position of said pivotal arm means, and including plate means adapted to be secured to the wheeled vehicle, and bracket means extending outwardly from said plate means for pivotally securing the arm means to the vehicle.

4,466,631

BALL JOINT ASSEMBLY FOR DRAFT ARM

David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

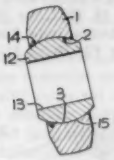
Filed Sep. 27, 1982, Ser. No. 424,006

Int. Cl.³ F16C *11/06*

U.S. Cl. 280—415 A **10 Claims**

1. A draft link having a bearing assembly comprising, a link defining a spherical socket having a spherical inner surface, a spherical bushing positioned in said spherical socket forming an interface between the outer periphery at said bushing and the spherical inner surface of said socket, means defining an entry slot extending lengthwise in the link for receiving the spherical bushing and assembly in said spherical socket, means defining an inner peripheral groove recessed in the spherical surface of the spherical socket on the entry side of said spheri-

cal socket, a retainer received in said groove and extending into said entry slot for retaining said spherical bushing in said



spherical socket and said bushing locking said retainer when said bushing and retainer are in their operating positions.

4,466,632

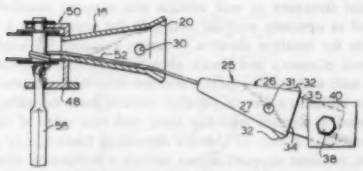
TRAILER HITCH HAVING A WINCH COUPLING ASSIST

Dwight F. DeVorak, Rte. 1, Box 268, Hazen, Ark. 72064

Filed Nov. 18, 1982, Ser. No. 442,637

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—478 R **9 Claims**



1. A heavy duty trailer hitch for coupling a trailing vehicle to a towing vehicle comprising:

a tapered sleeve means rigidly secured to said haulage vehicle and having an extended tapered portion with an enlarged bellmouth opening at one end thereof and a reduced dimension opening at a second end thereof;

said bellmouth opening having opposed faces diverging outwardly from said extended tapered portion, a winch means positioned adjacent said tapered sleeve means and including a cable drum being rotatably supported at said second end of said tapered sleeve means;

a cable means having one end thereof extending through said second end of said tapered sleeve means and being windable on said cable drum, said cable means having a second end extendable outward through said enlarged bellmouth opening of said tapered sleeve means; means to wind up said cable means on said cable drum; and

a trailer connector means secured to said second end of said cable means and having tapered faces thereon adapted to nest within said tapered portion of said tapered sleeve means in a complementary orientation and including spaced stop means having limited abutting surfaces to abut complementary spaced portions on said opposed faces of said bellmouth opening to provide a predetermined nonbinding, nesting penetration of said trailer connector means into said tapered sleeve means wherein a coupling pin is installed to retain said trailer connector means in said nesting relationship with said tapered sleeve means in a rigid towing assembly and further adapted to be outwardly extensible from said tapered sleeve means whereby said trailer connector means may be coupled to said trailing vehicle by unreeling said cable means from said cable drum to position said trailer connector means in a coupling orientation with said trailing vehicle and thereafter said trailer connector means is drawn into the nesting relationship with said tapered sleeve means by reeling in said cable means on said cable drum whereby said bellmouth serves to guide said cable means, and said trailer connector means into said tapered sleeve means to provide said rigid towing assembly.

4,466,633

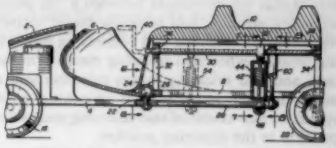
ARTICULATED VEHICLE

James C. Henley, 7240 S. 7th St., Sp. C44, Phoenix, Ariz. 85040

Filed Nov. 22, 1982, Ser. No. 443,377

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—492 **9 Claims**



1. In a vehicle of the type wherein there are provided forward and aft sections each equipped with wheels, and pivot means interconnecting said forward and aft sections so as to provide pivotal movement therebetween about horizontal and vertical axes, the improvement comprising:

a first shaft fixedly coupled to said forward section and extending rearward of said pivot means;

a second shaft coupled to said aft section and disposed above said first shaft when said forward and aft sections are in alignment; and

resilient suspension means coupled between said first shaft and said second shaft, the stiffness of said suspension means being manually adjustable so as to vary the degree of softness with which the vehicle will ride, said resilient suspension means, when displaced, serving to urge said first and second shafts toward alignment, thereby providing directional stability to said vehicle.

4,466,634

HEEL HOLDER FOR SAFETY SKI BINDINGS

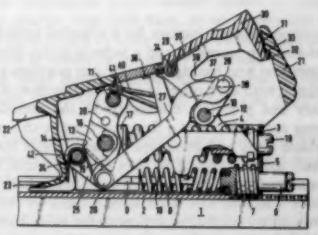
Walter Knabel, Murnau, and Ludwig Wagner, Farchant, both of Fed. Rep. of Germany, assignors to MARKER Patentverwertungsgesellschaft mbH., Baar, Switzerland

Filed Jun. 11, 1982, Ser. No. 387,423

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123435; Feb. 19, 1982, 3206051

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—632 **13 Claims**



1. A manually releasable heel holder for a safety ski binding, said heel holder comprising:

a housing;

a sole holder pivotally mounted on said housing for movement between a closed position for retaining a ski boot in the holder and an open position for releasing a ski boot, said sole holder including heel holding means for engaging the heel of a ski boot inserted in said heel holder;

biasing means for biasing said sole holder to the open position;

connecting means movably connected at one end thereof to said sole holder for movement between a locking position wherein said connecting means locks said sole holder in the closed position and an unlocking position for enabling said sole holder to move to the open position;

crank means pivotally attached to said housing; hinge means for connecting the other end of said connecting means to said crank means; and

manually actuable releasing means movably mounted on said sole holder for movement between a rest position and an actuating position, said releasing means including retaining means for retaining said connecting means in the locking position when said releasing means is in the rest position, and said releasing means releasing said connecting means for movement to said unlocking position in response to movement of said releasing means from the rest position to the actuating position;

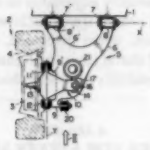
wherein said hinge means abutts said retaining means when said releasing means is in the rest position to retain said connecting means in the locking position.

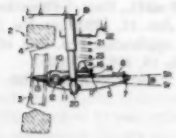
4,466,635

VEHICLE SUSPENSION MECHANISM

Tadashi Okada, Kanagawa; Yuji Furukawa, Tachikawa, and Makoto Murata, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 24, 1983, Ser. No. 469,416
Claims priority, application Japan, Mar. 31, 1982, 57-52721
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **2 Claims**





1. A suspension mechanism for a wheeled vehicle including a wheel-and-tire assembly and a vehicle body, comprising

a suspension arm having a pair of arm portions substantially aligned with each other in a lateral direction of the vehicle body and pivotally connected to the vehicle body for being rockable about a first axis fixed with respect to the vehicle body and transverse to the vehicle body;

a wheel axle, including an arm portion which is pivotally connected to said suspension arm, and which is rockable about a second axis fixed with respect to the suspension arm and substantially perpendicular to said first axis, and which has a spindle portion having a center axis about which said wheel-and-tire assembly is rotatable; and

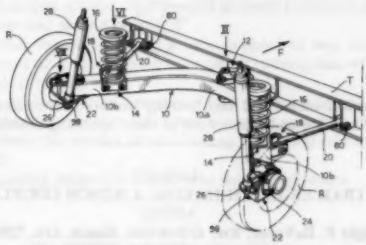
angle adjusting means engaging said suspension arm and said wheel axle and adapted to permit adjustment of the angular position of the wheel axle with respect to the suspension arm about said second axis, said angle adjusting means comprising a spacer element between said suspension arm and the arm portion of said wheel axle and fastening elements fastening together said suspension arm and said spacer element.

4,466,636

RIGID AXLE SUSPENSION FOR MOTOR VEHICLES

Felice Cornacchia, and Giuseppe Piritore, both of Turin, Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed May 19, 1982, Ser. No. 379,828
Claims priority, application Italy, Jun. 3, 1981, 67762 A/81
Int. Cl.³ B60G *11/14*
U.S. Cl. 280—724 **5 Claims**



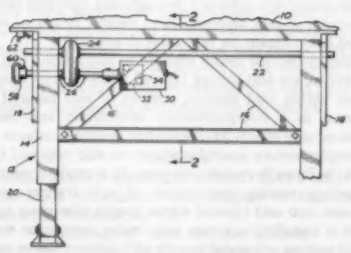
1. A rigid axle suspension for a motor vehicle having a support structure comprising a rigid axle, attachment means connected to said axle for pivotally connecting said axle to said support structure of said vehicle and support members connected at opposite ends of said axle for supporting a pair of wheels for rotation about a common axis and for supporting resilient elements and shock absorber elements between said rigid axle and said support structure wherein said attachment means includes a pair of parallel vertical form coupling plates disposed in contact with the front and rear sides of said axle respectively, a pair of U-bolts extending transversely of said plates, resilient support means having a horizontal axis interposed between the curved ends of said U-bolts and one of said plates for pivotal securement to said support structure and screw means provided at the free end of said U-bolts clamping the two plates against the axle and for clamping said resilient support means between said U-bolt and one of said plates.

4,466,637

POWER DRIVE MECHANISM FOR TRAILER LANDING GEAR

Carl A. Nelson, P.O. Box 371, Athena, Oreg. 97813

Filed Sep. 22, 1981, Ser. No. 304,616
Int. Cl.³ B60S *9/06*
U.S. Cl. 280—766.1 **4 Claims**



1. In combination

(a) a trailer landing gear assembly having a cross frame,

(b) a pair of upright housings secured to said cross frame,

(c) telescoping leg members projecting from the lower end of said housing and having a drive connection with said housings for extending and retracting said leg members,

(d) a driven shaft extending between said housings and having a rotative association with said drive connections

whereby to extend or retract said leg members upon rotation thereof,

(e) a gear reduction assembly on said driven shaft having an input shaft arranged to rotate said driven shaft through said gear reduction assembly and projecting from the latter,

(f) said input shaft being shiftable axially to change the output ratio of said gear reduction assembly,

(g) a drive motor having an output shaft,

(h) mounting means mounting said drive motor on said frame with its output shaft aligned axially with the input shaft of said gear reduction assembly,

(i) a coupling sleeve secured to said output shaft and having a releasable connection with one end of said input shaft for coupling said output shaft with said input shaft,

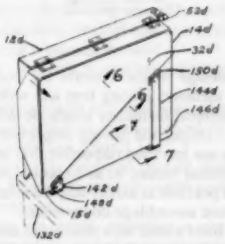
(j) said sleeve connection maintaining a drive connection between said input shaft and said output shaft in all shifting movements of said input shaft.

4,466,638

DIRECTORY HOLDERS

Renold A. Miskin, 752 Ashton Ave., Salt Lake City, Utah 84106

Filed Oct. 8, 1981, Ser. No. 309,603
Int. Cl.³ A47B *23/04*; B42D *9/00, 11/00*
U.S. Cl. 281—33 **6 Claims**



1. A directory holding device which is adapted to contain, preserve, support and secure a directory such as a telephone directory, said directory holding device comprising:

(a) a bed means adapted to receive a directory, said bed means having a top end, two opposite side ends and a bottom end, with the top side and bottom ends being adjacent the top, two sides and bottom, respectively, of a directory when the directory is received in said bed means;

(b) cover means having a top end, two opposite side ends and a bottom end;

(c) hinge means adapted for hingedly attaching said cover means, along one side end thereof, to a mutually respective side end of said bed means, so that the cover means can be moved from a closed position, in which it substantially overlies said bed means with the top, side and bottom ends thereof corresponding to and overlying the top, side and bottom ends, respectively, of said bed means, to an open position in which said cover means lies substantially adjacent to said bed means, whereby said cover means is adapted to cover the directory when said cover means is in the closed position overlying said bed means and to receive any portion of the directory when said cover means is in the open position lying adjacent to said bed means;

(d) flange support means at the respective bottom ends of said bed means and said cover means for supporting the pages of a directory when any portion of said directory is received in said bed means and said cover means, each of said flange support means being attached along their mutually respective longitudinal base edges to respective bottom ends of the respective bed means and cover means so that the respective flange support means extend in planes which are generally perpendicular with the bottom ends of the bed means and cover means; and

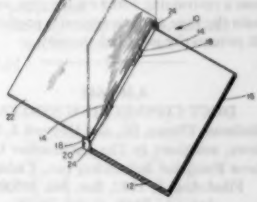
(e) means for holding the device in an upstanding position extending upwardly from a flat support base, such as a desk, with one of the longitudinal side edges of said device being adjacent to said support base, said means for holding the device further being adapted to allow the device to tilt along a tilt axis which extends upwardly to an acute angle to said support base, whereby when said device is moved to its tilted position, the bottom end of said bed means lies substantially adjacent to said support base and the broad, flat face of said bed means tilts upwardly from said support base in a plane lying substantially along said tilt axis.

4,466,639

LOOSE LEAF HOLDER

Charles L. Finnegan, 4210 N. 52nd St., Omaha, Douglas County, Nebr. 68104

Continuation of Ser. No. 141,249, Apr. 17, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,634
Int. Cl.³ B42D *3/12*; B42F *11/04*
U.S. Cl. 281—45 **5 Claims**



1. In combination, an improved holder for sheets of paper comprising:

(a) a rectangular substantially rigid base for supporting a stack of rectangular paper shaped similar to and sized slightly smaller than said base, so as to provide a firm surface upon which to write or draw on any sheet of paper supported in whole or in part by said base;

(b) a back panel disposed substantially normal to said base and being non-hingeably affixed along one edge of said base;

(c) two rectangular planar back panel corners, each said back panel corner being disposed and affixed normal to both said base and to said back panel;

(d) at least one magnetic body mounted proximal to said back panel between said two back panel corners; and

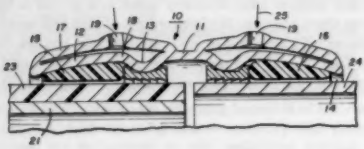
(e) a stack of paper with magnetically-responsive means permanently secured to each sheet of paper for operable magnetic interaction with said at least one magnetic body, such that each sheet of paper will become aligned during insertion by said back panel corners, and will be removably held in place by said at least one magnetic body, temporarily securing it along a single uninterrupted straight edge thereof to said at least one magnetic body, and continually maintained in an ordered position by said back panel corners when so secured.

4,466,640

PULLOUT RESISTANT PIPE COUPLING

James J. Van Houtte, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 5, 1981, Ser. No. 290,038
Int. Cl.³ F16L 17/02
U.S. Cl. 285—104 6 Claims



1. In a pipe coupling including a radially deformable elongated shell in which to receive a pipe section to be coupled, at least one gasket recess defined interior of said shell in a deformable section thereof and a gasket contained in said recess, the improvement for restraining pullout of a pipe section coupled thereat and comprising:

(a) an inward protuberance defined interior of said shell on a deformable section thereof axially displaced from said gasket recess; and

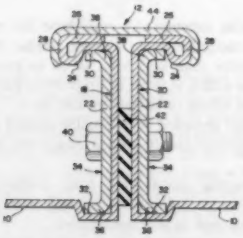
(b) a lock ring having a toothed inner face and including means adapted for positioned placement of the lock ring axially retained against the inner face of said protuberance, said lock ring when positioned placed against said protuberance being responsive to inward deformation of said protuberance to constrict radially inward into a penetrating gripping engagement with a contained pipe section to impose a restraining force on the pipe section sufficient to restrain the pipe section against a predetermined drawbar pull potentially incurred thereby.

4,466,641

DUCT CONNECTING SYSTEM

Robert R. Heilman, Elburn, Ill., and Howard J. McElroy, Cedar Rapids, Iowa, assignors to The Lockformer Company, Lisle, Ill. and Iowa Precision Industries, Inc., Cedar Rapids, Iowa

Filed Aug. 4, 1982, Ser. No. 405,061
Int. Cl.³ F16L 23/00, 25/00
U.S. Cl. 285—406 25 Claims



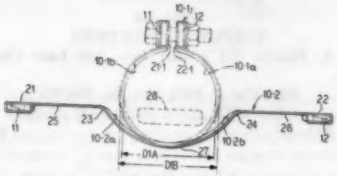
1. In a system for connecting the ends of sheet metal ducts wherein a frame is provided for each duct end, corner connectors defining perpendicularly extending arms are associated with the frames, and means are provided to interconnect the frames of adjacent duct ends, the improvement wherein the sheet metal used for the ducts is also employed for forming said frames, each said frame specifically comprising a roll-formed section consisting of an integral part of a duct wall, each said section comprising a first portion extending perpendicularly outwardly from a duct wall, and a second portion bent rearwardly into a position opposite an end portion of the duct wall, the distance between said second portion and said end portion substantially corresponding to the width of an arm of a corner connector, the side edges of each such arm being received in engagement with the respective surfaces of a second portion and end portion whereby the corner connectors are held in position relative to a frame, and including retainer means defined by said second portion for receiving a side edge of an arm for thereby securely holding the arm in position.

4,466,642

PREFABRICATION METHOD AND PREFORMED BAND FOR USE IN COUPLING TUBULAR MEMBERS

Stephen Tonchen, c/o Able Metal Hose, Inc., 15 Laura Dr., Addison, Ill. 60101

Filed Mar. 1, 1982, Ser. No. 353,108
Int. Cl.³ F16L 21/00
U.S. Cl. 285—419 10 Claims



10. An assemblage of parts useful for coupling first and second tubular members having first and second tubular end portions with nominal diameters which lie within a predetermined diametric range, and having respective actual circumferential extents not less than respective first and second minimum circumferential values, so as to secure the first and second tubular end portions in axially aligned relation with a joint therebetween, said assemblage comprising:

(a) a strip of sheet metal with reinforced ends, and

(b) progressively adjustable force means for application to said reinforced ends when the strip is wrapped about the joint between said first and second tubular end portions so as to progressively tighten the strip about the joint,

wherein the improvement comprises:

(c) said strip having a preformed arcuate bend therein intermediate the reinforced ends thereof providing first and second arcuate bend portions at opposite longitudinal sides of the strip and adapted to be placed in wrapping relation to portions of the circumference of said first and second tubular end portions,

(d) the strip having first and second longitudinal portions extending longitudinally between the reinforced ends thereof and extending along the first and second arcuate bend portions with the length dimensions of the first and second longitudinal portions being less than the first and second minimum circumferential values,

(e) the sheet metal of the strip providing generally oppositely extending end portions extending in generally opposite directions from said arcuate bend portion, and providing reversely curved connecting portions extending between the oppositely extending end portions and the arcuate bend portion with the curvature of the connecting portions being opposite to the curvature of the arcuate bend portion, and

(f) the sheet metal of the oppositely extending end portions and of the reversely curved connecting portions being in a ductile hand-formable condition so that the strip can be wrapped by hand about the first and second tubular end portions, the force means being thereafter applied to the reinforced ends so as to progressively tighten the strip into a stretched conforming relationship to the first and second tubular end portions and with the first and second longitudinal portions of the strip firmly gripping respectively the

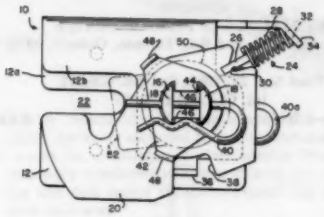
first and second tubular end portions to secure said tubular end portions in said axially aligned relation.

4,466,643

DOGGING DEVICE, METHOD OF FORMING THE SAME, AND AN ADAPTER KIT THEREFOR

Maksimilijan Godec; John R. Foster; Paul J. Straub, all of Indianapolis, and Allan K. Mahler, Terre Haute, all of Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed Aug. 3, 1981, Ser. No. 289,756
Int. Cl.³ E05C *19/02*
U.S. Cl. 292—92 **12 Claims**



1. A dogging device, for latching assembly having a translating latching and unlatching control rod, comprising:
first means defining a bearing surface;
a shaft journaled on its axis in, and extending normal to, said bearing surface;
second means, integral with said first means, having a recess formed therein in which to receive an end of a translating, latching and unlatching control rod;
keeper means, pivotably mounted on said shaft, for movement between first and second pivotable positions relative to said axis; wherein
said keeper means has means, operative in one of said positions, for engaging an end of a translating latching and unlatching control rod for securing such end against withdrawal from said recess; further including
detent means for restraining said keeper means, selectively, in either of said first or second positions; wherein
said shaft and said keeper means have mutually engaged keying surfaces formed thereon for causing coincident rotation thereof; and also including
operator means, slidably engaged with said keying surfaces of said shaft, for rotating said shaft to cause pivotable movement of said keeper means from either of said first and second positions to the other thereof; wherein
said operator comprises a plate; and
said plate has a pair of upstanding limbs, the same being disposed for engagement by a rotatably tongue of a locking and unlocking device.

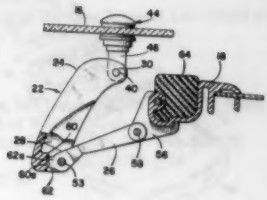
4,466,644

MULTI-POSITIONING LATCH ASSEMBLY

Ronald E. Wooten, Sunnymead; John Lehne, Hacienda Heights, and Gerald A. Kwan, Pasadena, all of Calif., assignors to LeVan Specialty Co., Inc., City of Industry, Calif.

Filed Jan. 18, 1982, Ser. No. 340,291
Int. Cl.³ E05C *17/34*
U.S. Cl. 292—263 **10 Claims**

1. A multi-positioning latch assembly for a hinged closure panel having a fixed frame, wherein the assembly comprises:
a latch-handle member having a first attaching end and a second attaching end;
means for pivotally attaching said latch handle to said panel, said means being pivotally attached to said first attaching end thereof;
a toggle arm having first and second pivotally attaching ends, said first attaching end being pivotally connected to said second end of said latch handle;
a bracket means secured to said fixed frame, said second attaching end of said toggle arm being pivotally connected thereto; and
means formed between said latch handle and said toggle arm for selectively positioning said panel between an intermediate open position and a fully closed locked position;



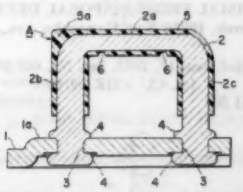
wherein said positioning means comprises:
a first pair of projection members formed on the second attaching end of said latch handle; and
a second pair of projection members formed on said first attaching end of said toggle arm, said first and second pairs of projections being adapted to engage each other for selective positioning of said panel.

4,466,645

AUTOMOBILE DOOR LATCH STRIKER

Fumio Kobayashi, Ayase, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Mar. 22, 1982, Ser. No. 360,243
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—341.12 **2 Claims**



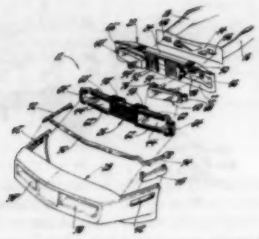
1. An automobile door latch striker, integrally mounted so an automobile body for keeping an automobile door closed by engaging with a door latch provided on the automobile door and releasing the door by disengaging from the door latch, characterized by that:
the striker comprises a U-shaped rod with a pair of spaced apart legs integrally interconnected by a horizontal portion, the legs being attached at their free ends to a base plate fixed to an automobile body;
one leg of the rod is adapted for engagement with the latch piece;
at least part of the rod which is adapted to be directly engaged with the latch piece of the door latch, in exclusion of both free ends thereof in the vicinity of the base plate, is covered with mold-formed elastomer;
and one leg of the rod which enters the door latch ahead of the other presents a columnar shape in spite of a certain curvature at the corner intersected by one of the legs of the rod which is to be pushed into the door latch ahead of the other leg and the horizontal portion of the rod.

4,466,646

ENERGY ABSORBING BUMPER ASSEMBLY FOR VEHICLES

John A. Delmastro, Romeo, Mich., and Paul D. Van Duyn, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1983, Ser. No. 469,646
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—117 5 Claims



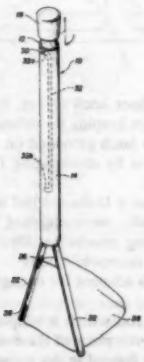
3. An impact bumper and lamp assembly for a motor vehicle having support structure therein, a resilient elongated bumper beam extending transverse of one end of said vehicle operatively mounted on said support structure and deflectable in response to transmittal of predetermined impact loads thereto, an electrically energizable lamp unit having an elongated shell-like housing and a lens closing said housing, hinge means yieldably attaching said lamp unit to said bumper beam in a spaced relation thereto and for limited swinging movement from an outer position to a retracted position so that impact loads transmitted to said lamp assembly will deflect said hinge means and displace said lamp assembly, and energy absorbing media means mounted on said bumper beam and disposed adjacent to said lamp assembly to dissipate impact energy by deflection.

4,466,647

ANIMAL FECES DISPOSAL DEVICE

Sidney M. Spevak, 10916 New Hampshire Ave., Silver Spring, Md. 20903

Filed Aug. 17, 1982, Ser. No. 409,044
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 BB 4 Claims



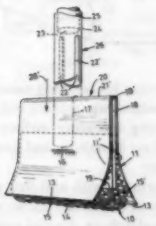
1. An animal feces disposal device comprising:
a wand including an elongated body portion having an upper and lower end, and a sleeve telescopically mounted to extend over the lower end of said elongated body portion;
a pair of substantially straight spring arms carried by the lower end of said body portion, normally tending to spread apart, but retained in a close juxtaposition by the sleeve prior to extension of said arms from said sleeve; and
a pair of clip means on each of said arms for attachment of a disposable bag of plastic or the like material and whereby said spring arms open the top of the disposable bag when said arms are extended from said sleeve, a said clip means on said spring arm being located at or near the end of said spring arm whereby said spring arms do not extend substantially beyond the attached disposable bag, said clip means being located along the inner surface of each said spring arm.

4,466,648

ANIMAL FECES PICK-UP DEVICE

Peter Albiez, 434 Millwood Rd., Toronto, Ontario, M4S 1K2, Canada

Filed Sep. 28, 1982, Ser. No. 426,181
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 BA 5 Claims



1. A device for picking-up animal feces comprising:
a first flexibly resilient, open-mesh element formed from a sheet shaped to present a substantially part cylindrical surface, such surface adapted to be pressed into the feces and to retain the same in the mesh openings;
a second imperforate shielding element folded over the open-mesh element, such shielding element having free edges;
a stiffening member having an edge extending toward but not touching the inner surface of said substantially part cylindrical surface;
fastening means securing the first and second elements together and compressing that part of the imperforate shielding element remote from the part cylindrical surface into a substantially planar handle portion and further securing the said stiffening member within the said planar handle member;
and the said free edges defining a surface situated between the said fastening means and a plane lying at a tangent to the part cylindrical surface.

4,466,649

EXTENDABLE HAND AMUSEMENT DEVICE

Shoji Ozawa, Nagareyama, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,241
Claims priority, application Japan, May 30, 1981, 56-79128[U]
Int. Cl.³ B25J *1/02*
U.S. Cl. 294—19 R 23 Claims

1. An amusement device, comprising:
(a) an arm having a first end and a second end;
(b) a shaft member also having a first end and a second end and being slidably connected in parallel relation to said arm for sliding in a direction away from said first end of said arm;

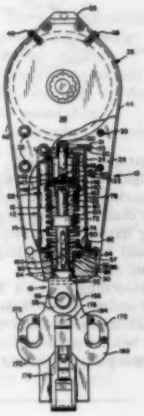
(c) a grip member movably mounted at said first end of said arm;
(d) a hand member mounted at said second end of said shaft member;
(e) a first spring means for holding said shaft member with potential energy for movement relative to said arm, wherein said first spring means has an elongated cylindrical spring, one end of which is connected to a hook located at the first end of said shaft member, the other end of said spring being connected to said first end of said arm,

and the middle of said spring substantially surrounding a pulley rotatably mounted to said second end of said arm;
(f) means for releasing said shaft member from a normally stationary relationship relative to said arm and for allowing said first spring means to extend said shaft member from said arm;
(g) stopping means for preventing said shaft member from totally leaving said arm when said release means and said first spring means are activated; and
(h) means for operatively connecting said movable grip member with said hand member.

4,466,650
GOLF BALL AND TEE HANDLING TOOL
Mark F. Roedel, 6730 Bailey, Taylor, Mich. 48180
Filed Sep. 30, 1982, Ser. No. 431,719
Int. Cl.³ A63B 57/00
U.S. Cl. 294—19 A **4 Claims**

1. A combination tool for handling a golf ball and a golf tee, comprising:
an elongated hollow member;
actuating rod means disposed in said hollow member for longitudinal movement thereto;
a first head mounted on a first end of the hollow member, and a second head mounted on the opposite end thereof;
the first head having an opening for receiving a tee in a position supported in the path of motion of the actuating rod means;
retainer means mounted in the first head for engaging the tee to releasably retain it in position, the tee being supported so as to be removed from the first head in response to a motion of the actuating rod means with respect to the elongated hollow member;
a plurality of jaw members mounted on the second head adjacent the actuating rod;
a guide member connected to the actuating rod and engaged with the jaw members to move them toward either a first spaced position for receiving a golf ball between them, or a second, closed position in which they engage the ball between them; and
bias means urging the jaws towards said closed position.

4,466,651
BLOCK
Michael J. Sowa, 865 Gatch St., and Joseph P. Sowa, 449 Marshall St., both of Woodburn, Oreg. 97071
Filed Sep. 9, 1981, Ser. No. 300,575
Int. Cl.³ B66C 1/34
U.S. Cl. 294—82 R **20 Claims**



1. A block comprising:
a hollow housing;
cylindrical guideway means loosely received within said housing;
means for retaining said guideway means loosely within said housing;
an elongated shaft having a first end extending axially into said guideway means and a second end adapted for supporting a hook, said shaft being axially slidable relative to said guideway means;
means for limiting the axial sliding of said shaft within predetermined limits;
biasing means for dampening the sliding motion of said shaft;
guide means slidably coupling said shaft to said guideway means for guiding the sliding of said shaft;
said cylindrical guideway means comprising a container means having a cylindrical wall and first and second end members, the shaft extending through a shaft receiving opening in the second end member and into the interior of the container means;
said guide means comprising means connected to said shaft and positioned within said container means for slidably engaging the internal surface of the cylindrical wall to guide the sliding of said shaft;
and said shaft including a central portion of reduced cross-sectional dimension relative to the cross-section dimensions of adjoining portions of the shaft, the second end member comprising a collar which is split axially into

plural collar sections, such collar sections being assembled and positioned to define a shaft receiving opening which surrounds the central portion of the shaft, the shaft receiving opening being of a cross-sectional dimension less than the cross-sectional dimensions of the adjoining portions of the shaft so that said collar retains the shaft within said container means.

4,466,652

CARRIER APPARATUS

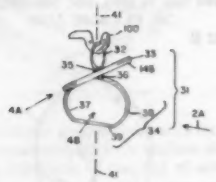
Montie M. Townsend, 6206 Gainsborough, Amarillo, Tex. 79106

PCT No. PCT/US80/01762, § 371 Date Dec. 23, 1980, § 102(e) Date Dec. 23, 1980, PCT Pub. No. WO82/02189, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 23, 1980, Ser. No. 261,104

Int. Cl.³ A47G *25/06*; B65G *7/12*

U.S. Cl. 294—142 **13 Claims**



1. A carrier apparatus comprising:

a rigid loop, a rigid ring and a straight bar,

said rigid loop having a major diameter and a minor diameter, said major diameter being larger than the minor diameter, said ring having a maximum diameter, said minor diameter of said loop being larger than the maximum diameter of said ring,

the rigid loop extending along a first plane and the ring extending in a second plane transverse to the first plane, and the bar extending between said rigid loop and said ring along the second plane and extending tangentially to the ring and being rigidly joined to the loop and to the ring.

4,466,653

AUTOMOBILE FRONT BODY STRUCTURE

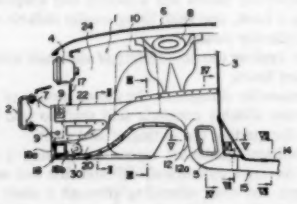
Hayathugu Harasaki, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 17, 1982, Ser. No. 419,577

Claims priority, application Japan, Sep. 18, 1981, 56-147161

Int. Cl.³ B62D *21/00*

U.S. Cl. 296—189 **5 Claims**



1. An automobile front body structure comprising a pair of side panels extending substantially longitudinally to form side walls of a front compartment, each of said side panels including a longitudinally extending side beam of a closed cross-section, said side beam having a main portion and a bifurcated front end portion including an upper branched portion and a lower branched portion, a front cross beam extending transversely and connected to the lower branched portions of the side beams in the side panels, a front bumper extending transversely and connected to the upper branched portions of the side beams whereby upon collision with an object, said upper branched portion will first be deformed to absorb the shock load of the collision and said lower branched portion will not be deformed until the deformation of said upper branched portion reaches a predetermined amount.

4,466,654

AUTOMOTIVE VEHICLE COWL CONSTRUCTION

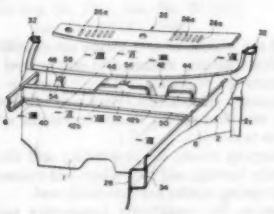
Masafumi Abe, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 17, 1980, Ser. No. 207,701

Claims priority, application Japan, Nov. 19, 1979, 54-150496

Int. Cl.³ B60G *1/04*; B62D *21/00*

U.S. Cl. 296—192 **6 Claims**



1. A cowl assembly for a vehicle comprising:

a first panel, having an air outlet opening, and extending generally transversly across said vehicle;

a second panel, having an air inlet opening, and being fastened to said first panel, said second panel extending in a generally spaced parallel relationship with said first panel and defining therebetween an air space;

a third panel, having first and second side edges, said third panel being fastened along said first edge to said first panel and extending through said air space to partition at least a portion of the air space from a remainder thereof, said third panel further having portions of said second edge fastened to said first panel to structurally support said first panel, said third panel further having at least one raised portion formed between said fastened portions of said second edge, said at least one raised portion extending generally toward said second panel and forming at least one opening between said third panel and said first panel for providing fluid communication between said partitioned portion of said air space and said remainder whereby air entering said air space through said air inlet opening may flow to said air outlet opening.

4,466,655

HEADLINING ARRANGEMENT

Shigeyuki Baba, and Tadayoshi Toda, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 16, 1982, Ser. No. 418,989

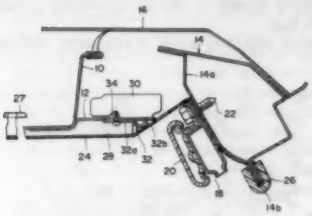
Claims priority, application Japan, Sep. 24, 1981, 56-149499

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—214 **2 Claims**

1. In an automotive vehicle having a sliding roof frame arranged to lie beneath a vehicle roof, a plurality of brackets attached to each lateral side of the sliding roof frame for the installation of same, and a passive seat belt sliding rail attached to a roof side rail, a headlining arrangement comprising a headlining hung up in a stretched state to the vehicle body by means of a set of plural listing wires, and at least one stretcher arranged to span an intervening space between adjacent two of the brackets to uniformly stretch a portion of the headlining adjacent said two brackets, wherein said stretcher is of a sheet

material strip and in the form of having a substantially flat anchor portion attached to the lower face of said two brackets and a semicircular sectional ridge portion extending along the



laterally outward end of said anchor portion, said ridge portion being located at the laterally outward ends of said two brackets and projecting downwardly therefrom while spanning the space intervening between said two brackets.

4,466,656

LIFTABLE ROOF PANEL ASSEMBLY

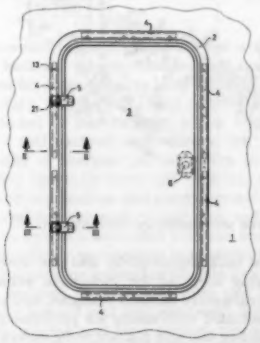
Richard Igel, Geremering, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,160

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136854

Int. Cl.³ B60J 7/08

U.S. Cl. 296—216 **12 Claims**



1. Liftable roof panel assembly for vehicles of the type having a cover for closing the area of a roof opening, a frame for perimetrically surrounding the edge of the roof opening and a lifting device, said lifting device being connected to the frame and to the cover for raising and lowering of a rear portion of the cover, wherein the lifting device is one of a plurality of different types of lifting devices that are selectively and interchangeably mountable to said frame, and is installed on a mounting plate which, in turn, is attached to the frame in a manner which allows easy replacement of said mounting plate.

4,466,657

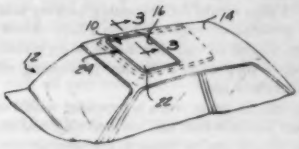
LIFTER APPARATUS FOR PIVOTAL-SLIDING ROOF PANEL ASSEMBLY

Milton C. Kaltz, Allen Park, and Richard H. Trotter, Southgate, both of Mich., assignors to American Sunroof Corporation, Southgate, Mich.

Filed Sep. 27, 1982, Ser. No. 424,072

Int. Cl.³ B60J 7/04

U.S. Cl. 296—221 **13 Claims**



1. A lifter apparatus for a pivotal-sliding roof panel in a vehicle having a roof opening comprising:

a guide rail mounted on the vehicle;

a guide shoe slidably disposed within the guide rail;

a link having first and second ends, the first end being pivotally connected to the guide shoe;

an attachment member secured to the roof panel and having an aperture formed therein;

the second end of the link being slidably disposed within the aperture in the attachment member;

a cam block mounted on the guide shoe, the cam block engaging the attachment member and urging the attachment member and the roof panel upward to close the roof opening; and

the link pivoting about the first end as the guide shoe moves further within the guide rail such that the second end slides within the aperture in the attachment member and urges the attachment member and the roof panel upward to a vent position in which the rear edge of the roof panel is disposed above the vehicle roof.

4,466,658

CRANK DRIVE

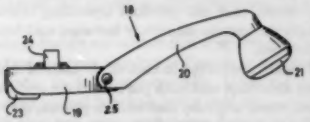
Arpad Fürst, Munich; Horst Bienert, Gauting, and Georg Kohlpaintner, Martinsried, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,425

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213708

Int. Cl.³ B60J 7/02

U.S. Cl. 296—223 **14 Claims**



1. A crank drive for controlling sliding movement and tilting movement of a cover of sliding-lifting roofs of motor vehicles, comprising:

A. a rotatable crank;

B. a stationary support having an internal toothing and disposed concentrically with respect to an axis of rotation of said rotatable crank;

C. an eccentric connected to said rotatable crank for rotation therewith;

D. a toothed ring having an external toothing disposed on

said eccentric for mating engagement with the internal toothing of said stationary support and for rotation about an axis which is displaced from said axis of rotation of the crank by an amount that is approximately equal to the difference between tooth-root circle radii of said internal and external toothings;

E. first stop means for limiting rotation of said crank at crank positions corresponding to fully pushed-back and fully tilted-out positions of the cover, said stop means being connected to said toothed ring for rotation therewith; and

F. second stop means for releasably locking said crank in a crank position corresponding to a fully closed position of the cover, said second stop means being connected to said stationary support in a manner preventing relative rotation therebetween;

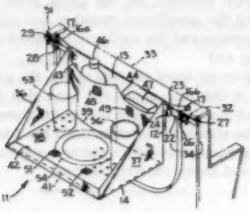
wherein said rotatable crank is provided with a crank chamber part within which said toothed ring, said eccentric and second stop means are housed, and wherein said stationary support is concentrically enclosed by said crank chamber part in a bearing relationship therewith.

4,466,659

SEAT BACK MOUNTED TRAY HOLDER

John R. Carpentier, No. 3 Graceland La., San Carlos, Calif. 94070, and Ruth L. Turner, 320 Bloom Grade, Boulder Creek, Calif. 95006

Filed Jun. 18, 1982, Ser. No. 389,918
Int. Cl.³ A47C *7/62*
U.S. Cl. 297—191 **20 Claims**



1. A seat back mounted tray holder, wherein a seat back-rest member extends between two spaced upright seat support members, comprising

a back portion,

a flexible bottom portion hinged along one side to said back portion and adapted to support a tray,

a planar stiffening member formed to fit within said flexible bottom portion,

opposing folding flexible end portions extending between and attached to adjacent ends of said back and bottom portions, said end portions operating when extended to limit the angular departure between said back and bottom portions,

and means connected to each of the ends of said back portion for attaching said back portion to the upright seat support members, whereby said bottom portion may be positioned between a substantially horizontal tray supporting position with said end portions extended and a stowed position alongside said back portion with said end portions folded.

4,466,660

MOVABLE BACKREST FOR TANDEM SEAT MOTORCYCLES

Earl Mable, 60 Sherwood Dr., Hooksett, N.H. 03106

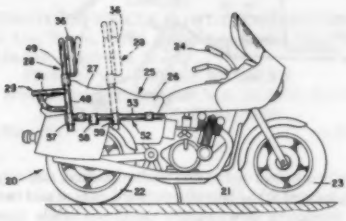
Filed Feb. 22, 1982, Ser. No. 350,646
Int. Cl.³ B62J *1/00*
U.S. Cl. 297—195 **13 Claims**

1. In a motorcycle of the type having tandem, double seats including a forward seat for the driver and a rearward seat for a passenger, the combination of:

a back rest assembly comprising;

a back rest having an upper portion with a back rest pad and a lower portion having a pair of depending parallel, spaced apart, legs;

and support means including a pair of elongated sub-frame



pieces, each affixed to said motorcycle to extend along one of the opposite sides of said tandem seats;

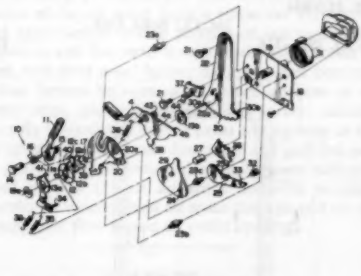
said sub-frame pieces each having a row of spaced, leg sockets therealong, forming a plurality of pairs of opposed sockets for slidably receiving the spaced apart legs of said back rest to selectively support said back rest in rear of said forward seat, in rear of said rearward seat, or at selected locations therebetween.

4,466,661

AUTOMOTIVE SEAT

Masanori Narita, Yamato, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 30, 1982, Ser. No. 445,763
Claims priority, application Japan, Dec. 19, 1981, 56-204535
Int. Cl.³ B60N *1/04*
U.S. Cl. 297—367 **1 Claim**



1. An automotive seat assembly, comprising:

a seat cushion;

a reclinable seat back supported by said seat cushion, said seat back being mounted for movement between forwardly and rearwardly inclined positions, said seat cushion being associated with means for performing walk-in motion permitting said seat cushion to be moved forward when said seat back is forwardly inclined; and

an operating lever device provided with means for preventing any part of said operating lever device from projecting out of the back or front face of said seat back when said seat back is forwardly or backwardly inclined, said means comprising:

a walk-in lever normally maintained at a predetermined position and connected such that, only when a seat back arm secured to said seat back is forwardly inclined, said walk-in lever is turned about a shaft on which said seat back arm is rotatably mounted;

a transmit plate mounted to be rotatable about said shaft and normally biased to be pressed against a projection provided on said walk-in lever;

a back release lever mounted to be rotatable about a pin provided on said transmit plate and normally biased to be pressed against a stopper portion of said transmit plate, said back release lever being arranged to depress an operating plate associated with means for reclining said seat back, thereby permitting said seat back to be turned; and

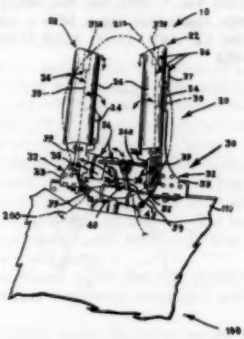
a depressing plate secured to said seat back arm and connected such that, only when the seat back arm is backwardly inclined, the depressing plate causes the back release lever to be turned backwardly, whereby said back release lever is prevented from projecting out of the back or front face of said seat back when said seat back is forwardly or backwardly inclined.

4,466,662

POWERED ARTICULATED HEADREST SYSTEM

Alexander B. McDonald, Long Beach, and Joseph T. Mannix, Seal Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 12, 1981, Ser. No. 320,893
Int. Cl.³ A47C 7/36
U.S. Cl. 297—406 **8 Claims**



1. A powered headrest system for use with a seat structure having a backrest, wherein said headrest system comprises:

a. means for supporting the head of an occupant of said seat structure, wherein this head support means is movably connected to said backrest and is originally positioned above said backrest, and wherein this means includes a plurality of headrest pad assemblies attached to and extending upwardly from said backrest, and also wherein each of said headrest pad assemblies includes a post, and a headrest pad mounted on said post; and

b. means, operably associated with said head support means, for selectively moving said head support means from said original position to another position located rearwardly of said backrest, downwardly from said backrest, and inwardly toward said seat occupant's head, and for selectively moving said head support means from said other position forwardly to said original position, wherein this means for selectively moving said head support means is controllable by said seat occupant and includes:

(1) means for pivotally connecting each post in a skewed relationship to said backrest;

(2) means, operably associated with said means for pivotally connecting each post, for interconnecting said plurality of posts;

(3) means for slidably moving each headrest pad along its corresponding post;

(4) means, operably associated with said means for slidably moving each headrest pad, for interconnecting said plurality of headrest pads; and

(5) actuator means, operably associated with said means for interconnecting said plurality of posts and also operably associated with said means for interconnecting said plurality of headrest pads, for imparting motion to both of these interconnecting means;

whereby said seat occupant can move said head support means to a plurality of positions rearward and downward to said backrest without obscuring his vision; and

whereby said posts are pivotally movable rearwardly and downwardly of said backrest, said headrest pads are movable downwardly along said posts, and said posts with said headrest pads thereon are movable inwardly toward each other, with all said movements being in one continuous motion; and

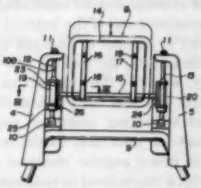
thereby said height of said head support means decreases, and said width of said head support means also decreases.

4,466,663

HEAD-REST FOR SEAT OF VEHICLE

Yaichi Oishi; Katsuaki Maruyama; Kenji Takano; Takami Terada, and Motoi Hyodo, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aishin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 14, 1982, Ser. No. 388,425
Claims priority, application Japan, Jun. 26, 1981, 56-95571[U]
Int. Cl.³ A47C 7/36
U.S. Cl. 297—410 **4 Claims**



1. A head-rest mechanism of a seat for a vehicle, the seat having a front face, a rear face and two sides, said head-rest mechanism comprising:

first brackets fixed in an upright position at both sides on the upper edge of a seat back frame;

stays fixed in an upright position at both upper and lower ends of said stays on said first brackets;

supports elevationally slidably engaged with said respective stays;

second brackets fixedly secured to said supports, said second brackets having upper and lower flanges connected by a bracket body to form substantially U-shaped second brackets, said second brackets being secured to said supports such that said upper and lower flanges are respectively engaged with upper and lower ends of said supports;

at least one head-rest supporting rod laterally extending between said second brackets and fixedly secured thereto; and

a frame of the head-rest directly secured to said head-rest supporting rod; and

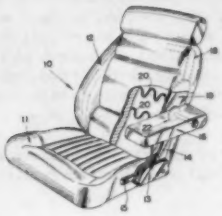
locking means provided on at least one of said stays for elevationally and adjustably positioning said supports along said stays to selectively position said head-rest frame.

4,466,664

SEAT WITH A RECLINING BACK AND AN ARMREST

Nobuaki Kondou, Yokohama, Japan, assignor to Nissan Motor Company, Limted, Yokohama, Japan

Filed Feb. 26, 1982, Ser. No. 352,895
Claims priority, application Japan, Mar. 26, 1981, 56-44479
Int. Cl.³ A47C *7/54*
U.S. Cl. 297—411 **6 Claims**



1. A seat having a seat cushion and a seat back, the seat back being changeable in angular position with respect to the seat cushion, the seat comprising:

(a) a side bracket secured to the seat back and having at least one hole extending therethrough;

(b) an armrest pivotally connected to the side bracket and thereby being variable in angular position with respect to the seat back, the armrest having a set of holes spaced in a direction of angular movement of the armrest; and

(c) at least one tab movably extending through the hole of the side bracket and thereby engaging the side bracket, the tab being selectively movable between a locking position in which part of the tab is positioned in any one of the holes of the armrest and an unlocking position in which the tab is positioned out of the holes of the armrest, the tab being thereby in and out of engagement with the armrest when the tab assumes the locking and unlocking positions respectively, whereby the armrest can be fastened to and released form the seat back when the tab assumes the locking and unlocking positions respectively, the tab being operative to selectably fix the armrest in any one of a plurality of preset angular positions with respect to the seat back which correspond to positions of the holes of the armrest respectively, whereby a change of the hole of the armrest in which the part of the tab is positioned causes a change of the preset angular positions in which the armrest is fixed.

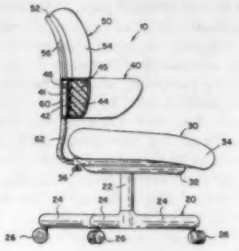
4,466,665

CHAIR HAVING ADJUSTABLE CANTILEVERED LUMBAR-SUPPORTING ARM

Robert Aronowitz, 40 E. 84th St., New York, 10028, and Bernard Katzanek, 100 Caton Ave., Brooklyn, N.Y. 11218

Filed Jan. 25, 1982, Ser. No. 342,574
Int. Cl.³ A47C *7/40, 7/54*
U.S. Cl. 297—418 **5 Claims**

1. An arm chair having a base, a seat, a back and a pair of arms extending horizontally above said seat and cantilevered from said back, the inner surface of said arms forming an angle between about ten and twenty degrees relative to a vetical line drawn perpendicularly from said seat thereby providing lumbar support for a person sitting in said chair, and means for adjusting the height of said arms relative to said seat.

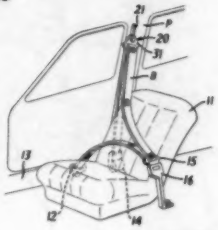


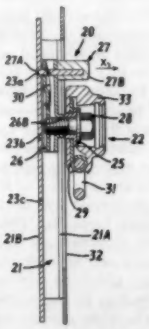
4,466,666

SEAT BELT ANCHOR ASSEMBLY

Juichiro Takada, 12-1,3 Chome, Shinmachi, Setagaya-ku, Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,217
Claims priority, application Japan, May 1, 1981, 56-062680
Int. Cl.³ A47D *15/00;* **A62B** *35/00*
U.S. Cl. 297—483 **1 Claim**





1. A seat belt anchor assembly comprising an elongated rail of substantially C-shaped cross-section and having inturned side flanges defining a slot and holes spaced-apart along the back wall, a hollow slider received within the rail and having side wall portions underlying the side flanges and an internally threaded protrusion extending out through the slot in the rail, a belt anchor plate pivotably attached to the slider by a bolt threaded into the protrusion, a lock pin extending through

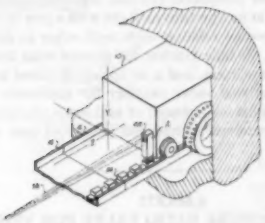
aligned holes in the front and back walls of the slider and adapted to be received in a selected one of the holes in the back wall of the rail, and a leaf spring received within the slider and engaged between the slider and the lock pin to urge the lock pin into the selected hole in the rail.

4,466,667

LONGWALL SHEARER TRACKING SYSTEM

Peter D. Poulsen; Richard J. Stein, and Robert E. Pease, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 15, 1982, Ser. No. 441,897
Int. Cl.³ E21C *35/08*
U.S. Cl. 299—1 **15 Claims**



1. Apparatus for tracking the movement of a longwall coal shearer along a desired path along a longwall coal face of the type which travels over rails and is driven by means of a drive gear and toothed drive rack, said apparatus comprising:

a continuous rectangular light beam image;

optical tracking means carried at one end of said path including light transmission means for converting said rectangular light beam image into separate alternating continuous horizontal and vertical rectangular light beams and alternately transmitting said horizontal and vertical light beams down said path;

retroreflector means carried by said shearer for receiving said alternating continuous horizontal and vertical light beams;

said retroreflector means including means for converting said alternating continuous horizontal and vertical light beams into a series of discreet horizontal and vertical light beam images at periodic intervals along said path which are reflected back to said optical tracking means;

said retroreflector means reflecting said horizontal and vertical light beam images responsive to the vertical and horizontal deviations, respectively, in the movement of said shearer and corresponding displacement of said retroreflector means from said desired path as carried thereon;

said optical tracking means including optical receiving means receiving said horizontal and vertical light beam images; and

recording means for recording said images as a function of the position of said shearer along said path for viewing so that the travel of said shearer may be corrected.

4,466,668

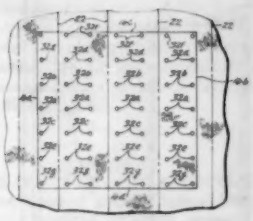
METHOD OF FORMING AN IN SITU OIL SHALE RETORT IN FORMATION WITH JOINTS

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction,, Colo.

Filed Mar. 28, 1983, Ser. No. 479,483
Int. Cl.³ E21B *43/247*; E21C *41/10*
U.S. Cl. 299—2 **21 Claims**

1. A method for forming an in situ oil shale retort in a subterranean formation containing oil shale and having a major set of naturally occurring cleavage planes, the in situ retort containing a fragmented permeable mass of formation particles containing oil shale within top, bottom, and side boundaries of unfragmented formation, the method comprising the steps of:

excavating at least one void in the subterranean formation within the retort boundaries while leaving a zone of unfragmented formation within the retort boundaries having a generally horizontally extending free face adjacent the void;



forming at least one row of horizontally spaced apart explosive charges in the zone of unfragmented formation, such a row of charges being in a line about perpendicular to the strike of the major cleavage plane set; and

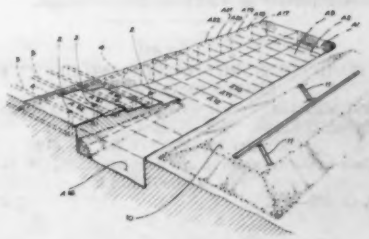
detonating all of the charges in the row about simultaneously for explosively expanding the zone of unfragmented formation toward the free face to thereby form the fragmented permeable mass of formation particles in the retort.

4,466,669

METHOD OF OPEN CUT MINING

Gordon Sellers, 632 Princes Hwy., Woonona, New South Wales, 2517, Australia

Filed Dec. 9, 1982, Ser. No. 448,297
Claims priority, application Australia, Dec. 18, 1981, PF2023
Int. Cl.³ E21C *41/00*
U.S. Cl. 299—7 **3 Claims**



1. A method of open cut mining comprising the steps of dividing an area of land to be mined into a substantially rectilinear grid formation, sinking or raising a shaft in each of the elemental areas of said grid formation, driving at least one tunnel into one or more seams of the minerals to be mined or in the surrounding rock, said tunnels linking said shafts;

installing a bulk transport system in said tunnels to remove material passed down said shafts to the surface;

mining said elemental areas in a terraced formation relative to adjacent areas being worked such that access from areas being worked to adjacent elemental areas are by means of access ramps, said overburden being deposited in said shafts and removed from the mining area by the transport system and the minerals being deposited into the shafts to be transported by said bulk transport system to a storage area external of the area of land to be mined.

4,466,670

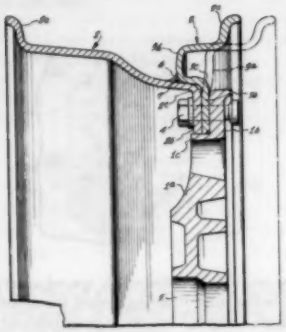
THREE PIECE WHEEL FOR VEHICLE TIRES

Yasutaka Kaji, 3, Chokeiji, Takaoka-shi, Japan

Filed Jul. 24, 1981, Ser. No. 286,618

Int. Cl.³ B60B *23/00*

U.S. Cl. 301—11 CD **2 Claims**



1. A three-piece wheel for vehicle tires comprising a disc defining an annular projecting mount extending about the perimeter thereof, an inner rim of integral construction defining an annular radial base portion extending parallel to said mount, an outer rim of integral construction defining an annular radial base portion disposed between, parallel to and in abutment with said mount and said base portion of said inner rim, a portion of said outer rim adjacent said base portion thereof defining a substantially "C"-shaped medial portion extending axially inwardly along a portion of said inner rim adjacent the base portion thereof, substantially perpendicularly from said base portion of said inner rim and axially outwardly therefrom to define an annular "V"-shaped groove extending between said inner rim and said medial portion of said outer rim, fastening means extending through the base portions of said inner and outer rims and said mount to secure said rims to said disc and an elastic sealing means disposed in said V-shaped groove to prevent air from passing therethrough.

4,466,671

FLUID PRESSURE CONTROLLING DEVICE FOR VEHICLE BRAKING SYSTEM

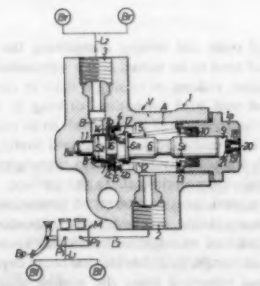
Koichi Miyasaka, Kosboku, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed May 15, 1980, Ser. No. 150,619

Claims priority, application Japan, May 18, 1979, 54-61748

Int. Cl.³ B60T *13/00*

U.S. Cl. 303—6 C **4 Claims**



1. An improved fluid pressure controlling device for vehicle braking system comprising a valve housing provided with an input chamber communicating with an output port of a master cylinder and an output chamber communicating with a rear wheel brake, a resilient valve seat separating said input and output chambers and provided with a valve port through which said input and output chambers communicate with each other, a valve member including a valve rod slidably held by said valve housing and extending through said valve port and a pressure-receiving piston formed integrally with said valve rod and received in said output chamber, said pressure-receiving piston being adapted to open and close said valve port, and a biasing means adapted to resiliently bias said valve member in a direction as to move said pressure-receiving piston away from said valve port, the improvement comprising: a conical valve seat surface formed at an inner peripheral portion of said resilient valve seat for cooperating with said pressure-receiving piston, an annular thin-walled portion adjoining and surrounding said inner peripheral portion, said thin-walled portion being formed at its opposite surfaces with a pair of annular grooves in an opposing relation with each other to define an annular narrowed, flexible portion for greater axial flexibility of said thin-walled portion, and a set spring disposed between said valve seat and said valve member for resiliently urging said valve seat against an end wall of said input chamber, said set spring being received at one end in one of said annular grooves.

4,466,672

VARIABLE PRESSURE RATIO VALVE FOR VEHICLE BRAKING SYSTEM HAVING DOUBLE VALVE ASSEMBLY SET AS FUNCTION OF VEHICLE LOAD

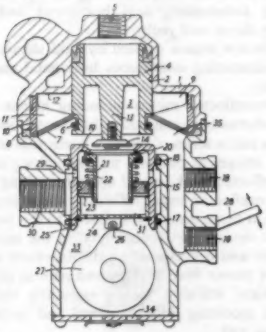
Bernard D. Maddrick, Bristol, England, assignor to Bendix Limited, Bristol, England

Filed Sep. 30, 1981, Ser. No. 307,126

Claims priority, application United Kingdom, Oct. 1, 1980, 8031561; Feb. 5, 1981, 8103539

Int. Cl.³ B60T *8/18, 15/20*

U.S. Cl. 303—22 R **9 Claims**



1. A variable pressure ratio valve for the braking system of a vehicle, said ratio valve comprising a housing having input, output, supply and vent ports, a variable area ratio assembly displaceable in said housing to vary the area thereof in response to the pressure differential between the input and output ports, said variable area ratio assembly including a fixed area piston portion communicated to the fluid pressure level at said input port and a variable area portion communicated to the fluid pressure level at said output port, double valve means for controlling communication between the supply, output and vent ports, said double valve means including cylindrical portion means slidably mounted in said housing, means responsive to the load carried by said vehicle for moving the cylindrical portion means within said housing in response to variations in the vehicle load, said double valve means including a pair of valve members carried by said cylindrical portion means for

controlling communication between the supply, output and vent ports whereby the position of the valve members in said housing is controlled as a function of the vehicle load, said valve members being communicated to said vent port through said cylindrical portion means.

4,466,673

HYDRAULIC BRAKE PRESSURE CONTROL SYSTEM OF VEHICLE LOAD RESPONSIVE TYPE

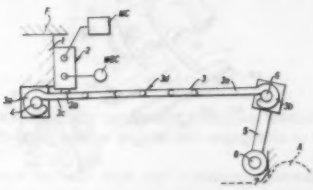
Hiroshi Takeshita, Chiryu; Tsutomu Chuwman, and Susumu Yamamoto, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 223,214, Jan. 7, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 483,852

Claims priority, application Japan, Jan. 16, 1980, 55-3849

Int. Cl.³ B60T *8/18, 8/22*

U.S. Cl. 303—22 R **10 Claims**



1. A hydraulic brake pressure control system for a vehicle having a wheel axle, a master cylinder, a body frame, and a wheel brake cylinder, said hydraulic brake pressure control system comprising:

(a) a load sensing torque bar in the form of a spring member having a plurality of curved portions formed in an intermediate portion thereof, each of said curved portions forming a torsional portion, said curved portions being disposed in a substantially horizontal plane;

(b) means for pivotally mounting first and second end portions of said torque bar on the body frame and on the wheel axle of said vehicle, respectively, such that said end portions lie in a common vertical plane; and

(c) a brake pressure control valve incorporated in a hydraulic connection between the master cylinder and the wheel brake cylinder, said brake pressure control valve having a spring-loaded valve manner upon which said torque bar bears so as to apply to said spring-loaded valve member a force proportional to vehicle load, said spring-loaded valve member lying in said common vertical plane.

4,466,674

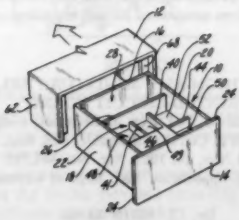
HOME VIDEO GAME STORAGE UNIT

Thom La Rose, 2107 Logan Dr., Sterling Hgts., Mich. 48077

Filed Sep. 13, 1982, Ser. No. 416,962

Int. Cl.³ A47B *91/06*

U.S. Cl. 312—250 **7 Claims**



1. A storage unit for a video component comprising:

a base having a front wall, rear wall and spaced side walls which together define an interior of said base, said base being open at its top and having a bottom stationarily supported on a ground surface,

at least one interior wall extending through the interior of said base and dividing said base into at least two compartments, each of said compartments dimensioned to hold a predefined video component,

a cover movable between a closed position in which said cover closes the open top of said base and an open position in which said compartments are accessible through the top of said base, said cover comprising a pair of side walls extending along but spaced outwardly from the side walls of said base, and at least one wheel secured to each cover side wall adjacent a bottom of each side wall, said wheels engaging the support surface.

4,466,675

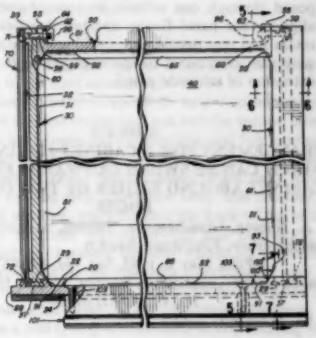
KNOCK-DOWN DRAWER ASSEMBLY

Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Oct. 19, 1982, Ser. No. 435,344

Int. Cl.³ A47B *88/00*

U.S. Cl. 312—263 **2 Claims**



1. A knock-down drawer assembly comprising:

a front panel having an outer face and an inner face, said front panel having a top margin, a bottom margin, and two generally vertical end margins, said front panel defining along its bottom margin on its inner face a channel extending between its end margins, said front panel defining two generally vertical and parallel dovetail mortises on said front panel inner face, one of said mortises being adjacent one of said front panel end margins and one of said mortises being adjacent the other of said front panel end margins;

a pair of side panels each having an inner face and an outer face, each said side panel having a top margin and a bottom margin, each said side panel having two generally vertical ends extending between said top and bottom margins, each said side panel defining along its bottom margin on its inner face a channel extending between said side panel ends, each said side panel having a dovetail tenon on one end of said side panel, each said tenon being adapted to be received in one of said front panel mortises;

a horizontal bottom panel having a front margin, a rear margin, and two parallel end margins, said bottom panel having an inner face and an outer face, said bottom panel front margin being adapted for being received in said channel of said front panel, one of said bottom panel end margins being adapted for being received in the channel of one of said side panels, the other of said bottom panel end

margins being adapted for being received in the channel of the other of said side panels;

a rear panel having an outer face and an inner face, said rear panel having a top margin, a bottom margin, and two end margins, said rear panel defining along its bottom margin on its inner face a channel extending between its end margins and adapted for receiving said rear margin of said bottom panel;

means for securing each end margin of said rear panel to one of said side panels adjacent one of said ends of said side panel;

each said side panel defining a rearwardly facing shoulder for abutting one of said end margins of said rear panel to locate said rear panel along the length of the side panel relative to said front panel;

each said side panel extending rearwardly beyond said shoulder and defines a side panel aperture extending between the inner and outer faces of the side panel;

each said end margin of said rear panel having a rearwardly projecting flange that is adapted to be positioned parallel to said rearward extension of one of said side panels and that is adapted to be positioned in face-to-face engagement with the one side panel rearward extension, each said rear panel rearwardly projecting flange defining a flange aperture for alignment with one of said side panel apertures; and

said securing means including a fastener adapted to be disposed through one of said side panel apertures and an aligned rear panel flange aperture for being secured to retain said rear panel against said said side panel shoulder with said rear panel flange engaged with said rearward extension of said side panel.

4,466,676

ARRANGEMENT FOR A CABINET HAVING A DOOR WHICH CAN BE SWUNG OUTWARDS FROM THE CABINET AROUND EITHER OF TWO OPPOSING EDGES

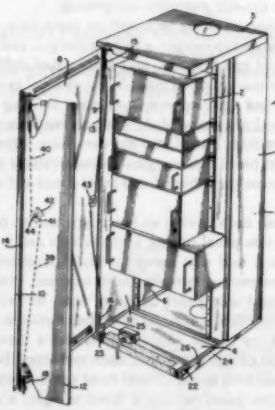
Nils A. Nilsson, Glanshammar, Sweden, assignor to Förenade Fabriksverken, Eskilstuna, Sweden

Filed May 2, 1983, Ser. No. 490,887

Claims priority, application Sweden, May 4, 1982, 8202771

Int. Cl.³ A47B *81/00*

U.S. Cl. 312—283 **7 Claims**



1. A cabinet having a door (8) with opposing edges (9, 10) which can be swung outwards from the cabinet around either of the two opposing edges (9, 10), characterised in that each of the opposing edges (9, 10) is connected with a side flap (11, 12) by the hinge member (13, 14), said side flaps respectively forming a wall portion in each of two side walls (6, 7) in the cabinet, and wherein each side flap (11, 12) has at least one locking device (15, 16 and 17, 18 respectively) for locking the side flaps to the cabinet whereby unlocking of the locking device (17, 18) on one of the side flaps (11, 12) permits the door (8) together with the said one side flap (11, 12 respectively) to be swung outwardly from the cabinet around the hinge member (13, 14) which connects the door (8) with the other side flap.

4,466,677

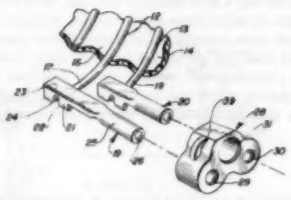
VACUUM CLEANER HOSE MANUFACTURE

John B. Lyman, Bloomington, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 30, 1979, Ser. No. 25,406

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—15 **10 Claims**



1. In a vacuum cleaner hose structure having a flexible hose portion defined by a tubular carcass having a plurality of coaxially spaced, helical spring wire electrical conductors included therein, said hose portion defining an end, electrical terminal means connected to said electrical conductors at said end of the hose portion comprising:

a plurality of electrical terminals each having a connecting portion, said terminals being mechanically and electrically connected one each to each one of said electrical conductors at said hose portion end;

a support device supporting said terminals in preselected spaced relationship; and

a cuff molded about said hose portion end, said electrical conductors at said hose portion end, and said support device, said terminal connecting portions being accessible for separable engagement with complementary electrical terminals for providing a separable electrical connection to said electrical conductors, said support device including a first portion supporting said connecting portion of the electrical terminals, and a second portion defining means for retaining the terminals connected to said conductors, said support device further having a third portion defining means arranged to prevent displacement of the support device during formation of the cuff, said second portion being movably connected to said first portion, said second portion further having latch means for holding the second portion in a retaining disposition about said hose portion end, electrical conductors, and electrical terminal second portions connected to said electrical conductors.

4,466,678

MOUNT FOR HIGH-AMP MINIATURE RELAY ON A PRINTED-CIRCUIT BOARD

Helmut Fuchs, Halver, Fed. Rep. of Germany, assignor to Karl Lumberg GmbH & Co., Schalksmuhle, Fed. Rep. of Germany

Filed Nov. 18, 1982, Ser. No. 442,761

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147674

Int. Cl.³ H01R *13/66*

U.S. Cl. 339—17 CF **11 Claims**

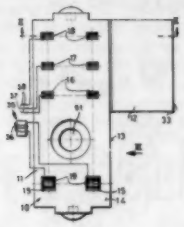
1. In combination with a high-wattage miniature relay having a plurality of high-amp connection prongs and of control-

voltage connection prongs, high-amp wires for connection to the high-amp prongs, and a circuit board, a mount comprising:

a dielectric body constructed to fit on the board and formed with

respective seats for the prongs, and

respective high-amp passages each having an outer end opening outward and an inner end opening at the seat for the respective high-amp prong;



respective low-amp conductors extending from the seats of the control-voltage prongs and engageable in the board; and

respective metallic high-amp conductors extending in the passages and having inner ends constituted as sockets for the respective high-amp prongs and outer ends constituted as connectors for the respective high-amp wires.

4,466,679

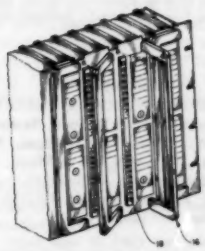
COMBINATION HANDLE AND COVER

Ronald E. St. Germain, Amesbury, Mass., and Paul Zdinak, Derry, N.H., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 1, 1983, Ser. No. 470,784

Int. Cl.³ H01R *13/447*

U.S. Cl. 339—44 M **6 Claims**



1. A combination handle and cover apparatus for use with a plug-in device having an electrical terminal strip on a front end, said device contained within a mainframe assembly, said apparatus comprising:

first means for covering the electrical terminal strip and for inserting the device into and removing the device from the mainframe assembly; and

second means attached to said first means and also hingably attached to the front end of the device such that in an open position, said first means functions as a handle and in a closed position, said first means functions as a cover.

4,466,680

ELECTRICAL CONNECTING DEVICE

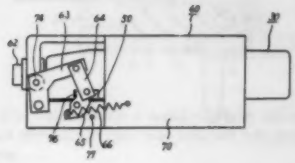
Hirohumi Sakai; Toshiaki Sukeda; Hiroyuki Yodoshi, all of Suzaka, and Satoru Imai, Nagano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1981, Ser. No. 333,785

Claims priority, application Japan, Dec. 29, 1980, 55-187224

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—45 M **10 Claims**



1. An electrical connecting device comprising:

(a) a first connector unit with

(i) an electrical terminal and

(ii) a groove; and

(b) a second connector unit with

(i) an accepting port,

(ii) an electrical terminal,

(iii) a rotating member having a hook for engaging the groove in the first connector, and

(iv) a rotating lever coupled to said rotating member, wherein the first connector unit and the second connector unit are connected by inserting said first connector unit into the accepting port of the second connector unit, said rotating lever rotates when said lever is pushed by said first connector unit, thus rotating said rotating member, and engaging the hook of the rotating member with the groove of said first connector unit such that the rotating member continues to rotate in combination with the inserting operation of said first connector units, and simultaneously further pushes the first connector unit in the inserting direction, and wherein a coil spring is connected to said rotating member for biasing said first connector unit in the inserting direction.

4,466,681

SOLDERING LUG FOR MOUNTING ELECTRICAL CONDUCTING WIRES

Gerhard Meindl, Ailing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 209,317, Nov. 24, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 419,416

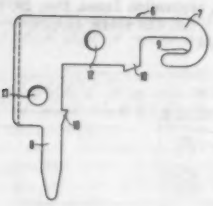
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950415

Int. Cl.³ H01R *9/06*

U.S. Cl. 339—97 R **8 Claims**

1. A coil form soldering lug for electrical connection to conducting wire ends of a coil wound on the coil form, said soldering lug being adapted for support-mounting in a flange of the coil form, the soldering lug comprising at its conducting wire attachment end lamellar leaf-spring members forming planar contact surfaces spaced directly across from each other, said planar contact surfaces being joined together at an apex and with a continually increasing spacing apart from one another away from the apex so as to define a V-formation, a spacing of the leaf-spring members ends away from the apex being sufficient to freely receive said coil conducting wire end therebetween, the leaf-spring members being shaped and spaced so as to scrape against the wire end with continually increasing pressure as it is drawn in towards the apex of the V-formation so as to provide a secure connection and to strip

away portions of an insulating material which may be present at the wire end, an end of the soldering lug opposite the spread apart V-formation end being designed as an electrical connection pin, and the soldering lug having a supportmounting center section being adapted for shift-free mounting in a slot-like perforation of the coil form flange.



4,466,682

TERMINAL BLOCK FOR ELECTRIC CONNECTION WITHOUT STRIPPING

Marcel Jusseau; André Borne, both of Villeurbanne; Gilbert Fermond, St-Pierre de Chandieu, and Jéan P. Heng, Lyons, all of France, assignors to CGEE Alsthom, Levallois-Perret, France

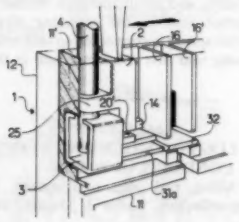
PCT No. PCT/FR82/00064, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/03501, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 1, 1982, Ser. No. 432,915

Claims priority, application France, Apr. 3, 1981, 81 06813

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—97 R **7 Claims**



1. A terminal block for electric connection without stripping, said block comprising a housing (**1**), at least one conductive connection part (**3**) fixed within said housing having two laterally spaced opposing lips (**30, 30'**) which form therebetween a blocking and stripping slot open towards the inside of a groove (**13**) within said housing which contains it and aligned along the longitudinal axis of said groove, the improvement comprising at least one pusher (**2**) maneuverable from outside the terminal block (**1**), means for movably mounting said pusher in said groove for movement in translation long the longitudinal axis of the groove between a partial interpenetration position within the blocking and stripping slot and a position which allows the insertion of a suitable wire (**4**) between the pusher and the slot opening, so as to allow the core of a wire to be inserted by force into the slot when the pusher is brought into the partial interpenetration position under the action of an outside maneuvering force, and said housing having side faces (**10, 10'**) defining said groove with longitudinal ribs provided parallel to and above the lips (**30, 30'**) of the slot and being slightly wider apart than said lips so as to hold the insulation of the wire (**4**) whose core is held in the slot.

4,466,683

MODULAR STRIP FUSE CARRIER ASSEMBLY

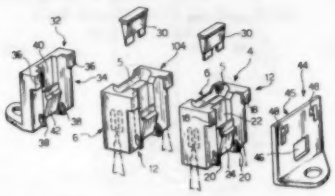
Ottavio Ballarini, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 8, 1982, Ser. No. 396,502

Claims priority, application Italy, Mar. 17, 1982, 67338 A/82

Int. Cl.³ H02B *1/04*

U.S. Cl. 339—125 R **3 Claims**



1. A strip fuse carrier assembly for motor vehciles, comprising:

a plurality of identical, modular, fuse-carrying components with two opposite faces;

at least one support member fixable to the vehicle bodywork;

respective attachment means on said opposite faces of the components and on said support member, whereby the attachment means on one said face of one component is engageable with the attachment means on the opposite said face of another component or with the attachment means on said support member, and

resiliently interengageable locking means on said faces of each component and on each support member respectively, for maintaining the components in their positions of engagement, wherein:

each fuse-carrying component comprises a block with a socket for a respective strip fuse;

the attachment means on said one face of the block comprise rectangular seats and sockets, and the attachment means on said opposite face of the block comprise L-shaped projections and hooks, and

the interengageable locking means comprise respectively a flat and a tab on said one face and a resilient tongue on said opposite face.

4,466,684

LOW INSERTION FORCE CONNECTOR

John L. Grant, Sherborn; Emanuel D. Torti, Newton; Austin S. O'Malley, Reboboth; Thomas W. Galligan, Norton, and Stephen D. DelPrete, Reboboth, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

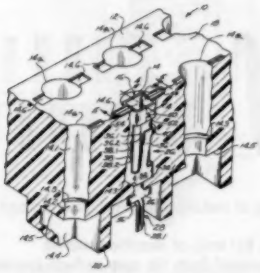
Filed Dec. 17, 1981, Ser. No. 331,728

Int. Cl.³ H01R *9/08*

U.S. Cl. 339—176 M **5 Claims**

2. A connector comprising a body of electrical insulating material having a top and a bottom and having a plurality of openings extending through the body from the top to the bottom, each opening having walls defining a first relatively large inlet portion adjacent the top of the body and a second relatively smaller portion located intermediate the inlet portion of the opening and the bottom of the body, and a plurality of electrical conductors formed of a strip of an electrically conductive metal spring material disposed in the respective body openings, the conductors each having a first receptacle portion disposed in the inlet portion of a body opening to receive and resiliently engage a terminal inserted axially into the opening and having a second portion extending through the second portion of the body opening to be electrically connected in an

electrical circuit, characterized in that, the receptacle portion of each conductor comprises an integral bridge part of the conductor strip material disposed in the inlet portion of its respective body opening and four integral leaf springs extending from the bridge part toward the top of the body with pairs of the leaf springs disposed so that the leaf springs in each pair are in spaced facing relation to each other around a common axis of the opening extending into the inlet portion of the body opening, the leaf springs each have a first surface disposed obliquely relative to said axis to initially intercept and be moved by a terminal being axially inserted into the inlet portion of the opening along the opening axis to establish a selected spring force in the leaf spring and have an adjacent contact surface to electrically engage a terminal with said selected spring force when the terminal is positioned in the inlet portion of the body opening, the contact surfaces of a first pair of the leaf springs are spaced relatively closer to the top of the body than the contact surfaces of the second pair of leaf



springs for reducing the force required for inserting the terminal into the inlet portion of the opening, the obliquely disposed terminal-intercepting surfaces of said second pair of leaf springs are spaced relatively further from the top of said body than said contact surfaces of said first pair of leaf springs, the conductor strip material has an integral gauge part connected to distal ends of said second pair of leaf springs which are relatively longer than said first pair of leaf springs, opposite ends of the gauge part have a dove tail and a dove-tail groove respectively which are fitted together so that the gauge part defines the perimeter of a gauge aperture of selected size for defining and limiting the cross-section of a terminal-receiving space located along said common axis between the springs of the two leaf spring pairs, and said contact and obliquely disposed terminal-intercepting surfaces of said second spring pair extend into said space for a relatively lesser distance than the corresponding surfaces of the first pair of springs for limiting the spring forces provided by the springs connected to said gauge part.

4,466,685

COAXIAL CONNECTOR ELEMENT

Christian Tronchon, Voiron, France, assignor to S.A. Radiall, Rosny-Sous-Bois, France

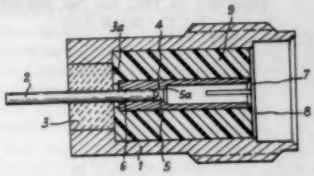
Filed May 20, 1981, Ser. No. 265,434
Claims priority, application France, May 23, 1980, 80 11578
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **6 Claims**

1. A coaxial connector element comprising

a tubular body having an internal cavity

an axial rod secured against axial motion in said body by a bead made from dielectric material, said axial rod protruding from the tip of said body closed by said bead, and

a central contact having an axial hollow for its engagement around said rod within said body, an insulator between said central contact and the wall of said cavity in said body, said central contact having near its tip, engaged in said axial rod, an annular shoulder which protrudes inwardly into the axial hollow provided on said central contact, and said central contact having its tip slotted, adjacent said annular shoulder, with a plurality of longitu-



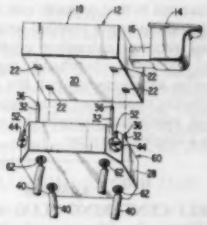
dinal slits which confer a radial elasticity thereon to permit said shoulder to pass over said rod and penetrate into said rod.

4,466,686

SWITCH CONNECTION ADAPTER

John M. Houser, Pickens, S.C., assignor to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 225,483, Jan. 15, 1981, abandoned. This application Jan. 6, 1983, Ser. No. 456,176
Int. Cl.³ H01R *23/10, 27/00*
U.S. Cl. 339—196 M **6 Claims**

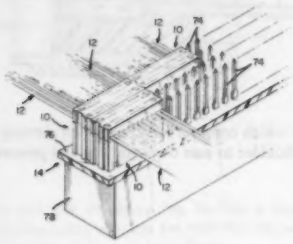


1. Arrangement for converting a wire trap connection system for receiving stripped wire end to establish a connection which becomes tighter on any attempt to withdraw said wire, to screw clamp connection in a portable electric tool having a housing and a switch control supported internally of said tool housing and having a wire trap system for connection thereto, said arrangement having a connection adapter module for permanent insertion into said wire trap system internally of said housing to provide screw clamp connections to said switch control for the portable electric tool enabling the tool to be rewired or said switch control replaced by a customer with a standard screwdriver, comprising: an insulator body piggy-backed on said switch control; and a plurality of connector elements carried by said instulator body, said connector elements each comprising an insert including a hollow portion captured within said insulator body for receiving a wire therein and having a screw threaded through the wall of said portion and accessible externally of said insulator body for clamping said wire within said portion, and a thin wire-like projection extending from said portion projecting out of the insulator body to be permanently engaged with said switch control wire trap system.

4,466,687
LOW PROFILE CONNECTOR PROVIDING HIGH DENSITY APPLICATION

Robert H. Frantz, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 20, 1982, Ser. No. 380,169
Int. Cl.³ H01R 9/02
U.S. Cl. 339—198 H **10 Claims**

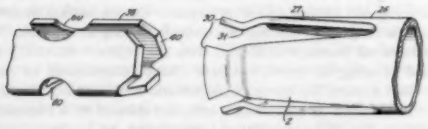


1. An electrical connector for making an interconnection between conductors and a high density continuous array of fixed uniformly spaced terminals, said connector comprising an elongated housing of insulative material having a mating face and an oppositely directed terminating face with a plurality of terminal passages extending between said faces in at least two parallel spaced rows, a like plurality of terminals each mounted in a respective terminal passage and having a mating portion directed towards said mating face and a conductor engaging portion extending from said terminating face, and a cover adapted to be received on said terminating face of said housing and having therein a like plurality of terminal passages each aligned with a respective terminals passage of said housing, characterized in that opposite end portions of said connector housing and cover are profiled with a keyed series of projections and recesses extending continuously between said housing and said cover whereby like connectors can be stacked in an edgewise arrangement with the end most terminal passages of adjacent connectors being spaced apart a distance no greater than twice the distance between adjacent terminal passages in a single connector.

4,466,688
SELF-CENTERING PLUG AND SOCKET

Loren A. Singer, Jr., Mamaroneck, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,827
Int. Cl.³ H01R 13/12
U.S. Cl. 339—252 R **1 Claim**



1. In a combination pin and socket construction for establishing electrical conductivity, said socket defining a generally arcuately-shaped recess for the reception of said pin, the improvement comprising: said pin being of generally open polygonal cross section including a plurality of walls longituidinally interconnected by bent portions, two of said walls terminating in longitudinally extending parallel edges; said pin being resiliently compressible transversely of its principal axis to reduce the effective width thereof upon engagement with said socket, said plurality of walls being three in number, and interconnected by two 120 degree bent portions; said socket having an arcuately constricted contact area, said pin having corresponding notches in the parallel edges and bent portions thereof corresponding in configuration to said constricted contact area, said notches being of generally arcuate configuration and of a radius greater than said constricted contact area to effect point contact therewith upon engagement.

4,466,689
METHODS OF MAKING A TERMINAL AND PRODUCTS PRODUCED THEREBY

Dean I. Davis; Lyndon D. Ensz, both of Omaha, Nebr., and Matthew J. Grubelich, North Plainfield, N.J., assignors to AT&T Technologies, Inc., New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 2, 1982, Ser. No. 364,279
Int. Cl.³ H01R 43/02, 4/30
U.S. Cl. 339—263 R **13 Claims**

1. A method of making a terminal, said method comprising the steps of

advancing a flat strip of metallic material;

removing material from the strip to form spaced blanks;

bending portions of each blank to cause the blank to be formed into a terminal comprising a wall having a substantially cylindrical configuration with inner and outer surfaces and with opposing edge surfaces of the blank being disposed to each other to form a butt seam in the wall;

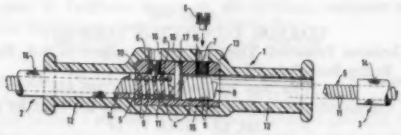
joining the adjacent edge surfaces of the wall to form a sealed seam; and then

forming a screw thead on the inner surface of the wall and across the sealed seam.

4,466,690
CONNECTOR FOR THE CONDUCTORS OF IMPLANTED MEDICAL DEVICES

Peter Osypka, Basler Strasse 109, D-7889 Grenzach, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 389,888
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124707
Int. Cl.³ H01R 4/02
U.S. Cl. 339—272 A **26 Claims**



25. A connector for joining the conductors of implanted medical devices, particularly the ends of broken conducting elements, comprising:

(a) an outer tubular member;

(b) a deformable inner tubular member accommodated in said outer member and designed to receive and clamp the end portions of a pair of conductors to be joined, said inner member including a helix; and

(c) at least one clamping member in said outer member for

deforming said helix so as to cause said helix to clamp the end portions of the conductors, the end portion of at least one of the pair of conductors to be joined being helical, and said helix receiving such end portion and having a pitch of the latter.

4,466,691

CONNECTING TERMINAL FOR CIRCUIT INTERRUPTER

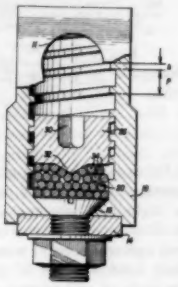
Pierre Batteux, St. Pierre de Mesage, France, assignor to Merlin Gerin, Grenoble, France

Filed Sep. 8, 1982, Ser. No. 415,995

Claims priority, application France, Oct. 5, 1981, 81 18839

Int. Cl.³ H01R *4/36*

U.S. Cl. 339—272 R **3 Claims**



1. A cable clamp terminal for connecting conducting cables to an electrical apparatus, said terminal comprising a terminal block having an elongated slot that defines two superposed housings, each of said housings being adapted to receive the end of a cable, and a tapped aperture extending generally perpendicular to said slot; and two threaded setscrews adapted to be secured into said tapped aperture, one of said setscrews being an intermediate screw for tightening the cable inserted in the lower housing between the block bottom and the intermediate screw, and the other of said setscrews being an upper screw for tightening the cable inserted in the upper housing between the intermediate screw and the upper screw, wherein the threading of the intermediate screw provides for longitudinal play relative to said tapped aperture, thereby allowing a limited axial sliding of the intermediate screw while fixing the intermediate screw in rotation.

4,466,692

INTEGRALLY FORMED INSULATOR ASSEMBLY AND METHOD OF MANUFACTURING THE SAME

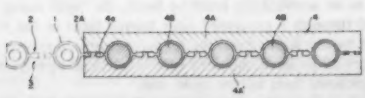
Keiji Sonoda, Hirakata, Japan, assignor to Nichifu Terminal Industries Co., Ltd., Osaka, Japan

Continuation of Ser. No. 239,803, Mar. 2, 1981, abandoned. This application Aug. 5, 1983, Ser. No. 520,741

Claims priority, application Japan, Aug. 9, 1980, 55-112827[U]; Oct. 2, 1980, 55-138494

Int. Cl.³ B29D *3/00*; B65D *73/02*

U.S. Cl. 339—276 SF **2 Claims**



1. An integrally formed insulator assembly comprising a series of sleeves disposed parallel to each other to serve as electrical connector coverings and belting web portions interconnecting the sleeves, said insulator assembly being formed of unit component segments, each unit component segment being successively made up by mold forming to have a certain overall length and including a plurality of the insulator sleeves made of a suitable plastic material adapted to receive therein electrical connector elements respectively so that the connector elements can be deformed under exertion of proper external force for clamping up the connector elements with proper electrical conducting material, and the belting web portions made of the plastic material integrally interconnected with the sleeves at certain intervals so that the sleeves are identically juxtaposed in parallel to one another for insertion of the connector element from a particular side properly, each segment having a first interconnection belting web portion integrally formed therewith to protrude at one longitudinal end and a second interconnection belting web portion integrally formed to protrude at the other end, said first interconnection belting web portion of one segment and the second interconnection belting web portion of another segment being integrally united together when said another segment is molded to thereby integrally connect both segments in longitudinal direction thereof, said first interconnecting belting web portion having first mating engagement means in the form of a flat and thin plate with at least one opening, and said second interconnecting belting web portion having second mating engagement means in the form of two flat and thin plates parallel to each other with at least one connecting portion between the two parallel plates so that when the succeeding unit component segment is integrally connected to the preceding unit component segment, the first mating engagement means in the form of a flat and thin plate is formed between the parallel plates of the second mating engagement means and integrally connected therewith to thereby constitute inter-locking of the first and second mating engagement means in which the connecting portion between the two parallel plates is located in the opening of the first mating engagement means.

4,466,693

HOLOGRAPHIC STRAIGHTNESS METER

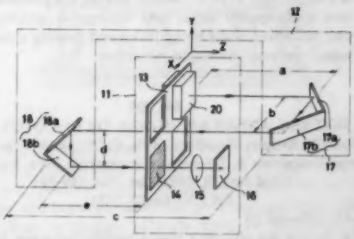
Kiyofumi Matsuda; Koji Tenjinbayashi, both of Ibaraki, and Tsuguo Kohno, Tokorozawa, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,460

Claims priority, application Japan, Nov. 25, 1980, 55-165618; Dec. 17, 1980, 55-178615

Int. Cl.³ G03H *1/02*; G01B *11/27*

U.S. Cl. 350—3.6 **8 Claims**



1. A holographic straightness meter for measuring lateral displacement of a moving member in directions perpendicular to the direction of the movement of said moving member relative to a fixed member comprising: light-emitting means for emitting an object beam and a reference beam from said moving member; a pair of reflection elements disposed on said fixed member and adapted to reflect said object beam and reference beam from said light-emitting means in colinear directions; a hologram disposed on said moving member and adapted to receive said object beam and reference beam coming from said

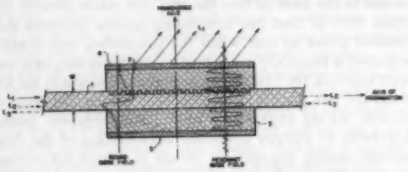
reflection elements and reconstruct said reference beam and said object beam; and, reconstructed image-forming means for focusing the object beam reconstructed by said hologram, whereby the lateral displacement of said moving member is determined by causing the object beam and reference beam from said light-emitting means to be brought onto said hologram, thereby enabling the resultant reconstructed beams to form interference fringes on said image-forming means, and enabling the obtaining of the lateral displacement of the moving member in accordance with the interval, number, and inclination of said interference fringes.

4,466,694

WAVELENGTH SELECTIVE OPTICAL COUPLER

Robert I. MacDonald, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jun. 8, 1979, Ser. No. 47,174
Claims priority, application Canada, Jun. 15, 1978, 305522
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.19 **7 Claims**



1. A wavelength-selective optical signal coupler comprising:

a. An elongated optical waveguide having a section containing a plurality of blazed corrugations, said corrugations including alternating projections and spaces along a wall parallel to the longitudinal axis of said waveguide, said waveguide including a width dimension normal to said longitudinal axis and measured between the maximum outermost surfaces of said waveguide and a longitudinal spacing dimension between adjacent projections, at least one of said dimensions varying progressively along the length of the waveguide in the section having the blazed corrugations so as to control the bandpass of the coupler; and

b. a Fabry-Perot type resonator having longitudinal reflective walls spaced about said waveguide section, one of said reflective walls being leaky and passing a bandwidth signal resonant with said resonator.

4,466,695

ROTARY ANNULAR SIGNAL DATA COUPLER

Bradford E. Kruger, Woodland Hills, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,263
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **8 Claims**

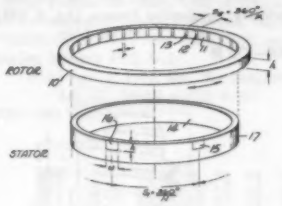
1. A device for effecting signal transfer between fixed first apparatus and rotatable second apparatus, comprising:

first means including a fixed first annular enclosure, said first enclosure comprising a first plurality of first light-transmissive windows each of width W, measured circumferentially, and height h, measured axially, along one axially extending surface of said enclosure;

second means comprising a second annular enclosure substantially concentric with said first enclosure and having a circumferentially and axially extending surface interfaced with said windowed surface of said first enclosure, said second annular enclosure being rotatable about the common axis about which said annular enclosures are concentric;

a plurality of second light transmissive windows in a circumferentially and axially extending wall of said second means, said second means windows having width r and being closely spaced radially with respect to said first means windows to form an optical signal transfer interface;

third means within said first means for generating and directing a light signal through said first means windows, said



light signal being modulated in accordance with signal data to be transferred across said interface;

fourth means including light-to-electric transducers arranged to be illuminated through a corresponding number of said second light transmissive windows during interface with said first windows, one of said transducers being provided for each of said second windows, to provide redundant output signals; and

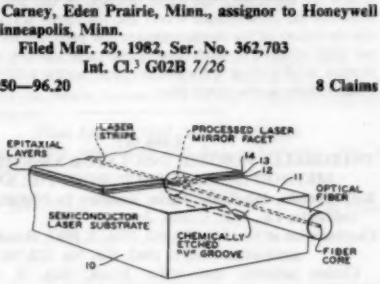
fifth means responsive to the transducer outputs of said fourth means for combining said transducer outputs to effect redundancy.

4,466,696

SELF-ALIGNED COUPLING OF OPTICAL FIBER TO SEMICONDUCTOR LASER OR LED

James K. Carney, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1982, Ser. No. 362,703
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **8 Claims**



1. In a self-aligned coupling of an optical fiber to an integrated stripe laser including a semiconductor substrate with epitaxial layers deposited thereon in which one of the epitaxial layers is an active light emitting layer, the light being edge emitted through a processed laser mirror facet in the region defined by the laser stripe, the improvement comprising:

an area of the semiconductor substrate extending beyond the processed laser mirror facet; and,

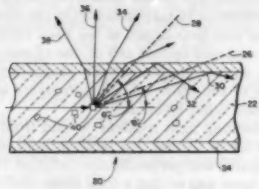
an etched V-groove in the surface of said extended substrate and centered in line with the light emitting stripe, said V-groove being of a depth compatible with the diameter of optical fiber to be coupled so that when such fiber is positioned in said groove, the core of said fiber is at the same elevation as said light emitting region.

4,466,697

LIGHT DISPERSIVE OPTICAL LIGHTPIPES AND METHOD OF MAKING THE SAME

Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012

Filed Nov. 12, 1981, Ser. No. 320,576
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.30 15 Claims



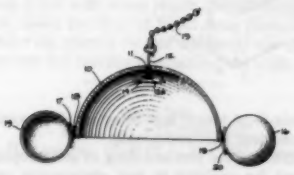
1. An optical fiber comprising an elongated light transmitting core means and electromagnetic radiation scattering means embedded in said core means, said electromagnetic radiation scattering means serving to scatter electromagnetic radiation passing longitudinally through said optical fiber laterally outwardly from the core means of said optical fiber and including small particles relatively spaced within said core means, said small particles being particles of nontransparent, reflective material.

4,466,698

EMERGENCY SIGNALLING DEVICE

William O. Gantz, 48-100 Desert Grove Dr., #22, Indio, Calif. 92201

Filed Mar. 24, 1983, Ser. No. 478,302
Int. Cl.³ G02B 5/12; G08B 5/00; A63H 33/40
U.S. Cl. 350—99 9 Claims



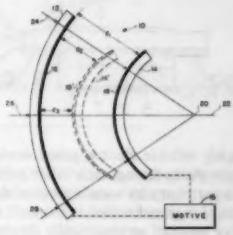
1. A signalling device comprising a rotatable surface having a plurality of spaced apart light reflective areas positioned thereon, said spaced areas each having a dimension sufficient to provide a reflected flash from a source of light, each of said areas having an area sufficient to provide a flash of a predetermined duration when exposed to said light source, the width and spacing of said areas conforming to a predetermined code, and means for rotating said surface whereby successive flashes will transmit an intelligible message.

4,466,699

CURVED TUNABLE FABRY-PEROT FILTER

Justin G. Droessler, Minneapolis, and Anil K. Jain, New Brighton, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 22, 1982, Ser. No. 341,923
Int. Cl.³ G02B 5/28
U.S. Cl. 350—166 10 Claims



1. A Fabry-Perot filter having spaced, curved, nonconcentric plates, at least one of which is aspheric; and

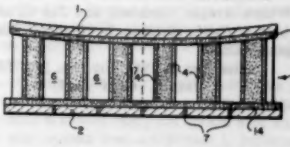
means operable to change the spacing between the plates.

4,466,700

LIGHTWEIGHT MIRROR ESPECIALLY FOR ASTRONOMICAL PURPOSES

Uwe Christiansen, Gelnhausen; Karlheinz Rau, Hanau; Anton Steinkohl, Rothenbergen, and Fritz Simmat, Gelnhausen, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,733
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018785
Int. Cl.³ G02B 5/08
U.S. Cl. 350—310 13 Claims

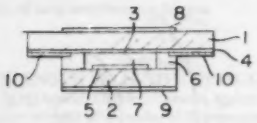


1. In a lightweight mirror, especially for astronomical purposes, having a front plate of clear vitreous silica or high-silica glass, a back plate of clear or opaque vitreous silica or high-silica glass and between said front plate and said back plate a core of clear or opaque vitreous silica or high-silica glass fixedly joined to these plates, a plurality of pieces disposed within said core and running in a plane generally normal to the plane of the front plate and the back plate, the materials selected for the front and back plates and the core having equal thermal expansion coefficients, the improvement wherein said pieces of said core are fixedly joined together by a sintered sintering composition to define a plurality of cavities, said sintering composition comprising, the same material as the pieces, and comprising granules, small tubes, rods, flakes or a mixture thereof, said sintering composition having a density less than that of vitreous silica or high-silica glass, as the case may be.

4,466,701
HIGHLY RELIABLE ELECTROOPTICAL DEVICE AND PROCESS FOR MANUFACTURING THE SAME

Satoshi Ogata, Miyoshi, and Hideyuki Fujimoto, Syobara, both of Japan, assignors to Optrex Corporation, Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,214
Claims priority, application Japan, Aug. 25, 1981, 56-132060
Int. Cl.³ G02F 1/13
U.S. Cl. 350—336 8 Claims



1. A highly reliable electrooptical device comprising a pair of electrode plates facing each other with a space and sealed along their periphery by a sealing material to form a cell and an electrooptical material sealed in the cell, characterized in that a protective layer of an electrically conductive material comprising electrically conductive particles and a binder is coated on each lead terminal extending outside the sealing material and the protective layer is partially embedded in the sealing material.

5. A process for manufacturing a highly reliable electrooptical device comprising:

(a) a step of printing an electrically conductive paste comprising electrically conductive particles and a binder on a lead terminal of one of a pair of base plates with an electrode and the lead terminal,

(b) a step of printing a sealing material on a predetermined position of the other base plate with an electrode,

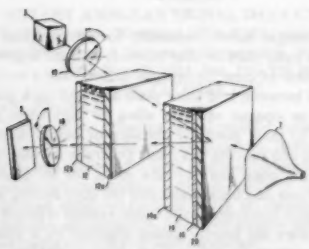
(c) a step of assemblying and pressing the two base plates to form a cell, and

(d) a step of sealing an electrooptical material in a cell gap, wherein said electrically conductive paste and said sealing material are printed in a relative positional relationship such that when the cell is formed, said electrically conductive paste is partially embedded in said sealing material.

4,466,702
LIQUID CRYSTAL LIGHT VALVE WITH BIREFRINGENCE COMPENSATION

Eliezer Wiener-Avnear, Carlsbad, and Jan Grinberg, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 1, 1981, Ser. No. 249,753
Int. Cl.³ G02F 1/133
U.S. Cl. 350—347 R 5 Claims



2. A light valve for controlling light propagating along an axis of propagation, said light valve comprising:

a pair of optically birefringent layers, each of said layers having a front surface and a back surface facing the back surface of the other layer, said front and back surfaces being nonparallel to said propagation axis;

each of said layers having a major optical axis corresponding to parallel refractive indices exhibited to radiation components polarized in a direction parallel to said optical axis and perpendicular refractive indices exhibited to radiation components polarized in a direction perpendicular to said optical axis;

wherein said optical axis of one of said two layers at its back surface is substantially perpendicular to the optical axis of the other of said two layers at the back surface of said other layer and said optical axis of one of said two layers at its front surface is substantially perpendicular to the optical axis of the other of said two layers at the front surface of said other layer; and

means for polarizing light incident on said front surface of one of said layers so that said incident light may resolve into said parallel and perpendicular radiation components in said one layer and so that a total phase shift of substantially zero is introduced between said parallel and perpendicular radiation components as they travel along said propagation axis through both said layers;

wherein one of said birefringent layers comprises a liquid crystal layer including a plurality of nematic molecules aligned so as to define the optical axis of said one layer, said light valve further comprising:

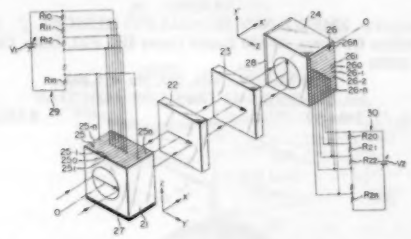
means for at least partially tilting said alignment of at least some of said nematic molecules in response to an image input; and

an analyzer, said analyzer and polarizing means each having a polarization axis perpendicular to that of the other and being non-parallel to the optical axis of each of said two birefringent layers.

4,466,703
VARIABLE-FOCAL-LENGTH LENS USING AN ELECTROOPTIC EFFECT

Yoshifumi Nishimoto, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,034
Claims priority, application Japan, Mar. 24, 1981, 56/42769; May 12, 1981, 56/71231; Jun. 26, 1981, 56/100013
Int. Cl.³ G02F 1/29
U.S. Cl. 350—379 10 Claims



1. A variable-focal-length lens using an electrooptic effect for focusing incident light comprising:

a first one-dimensional lens including an electrooptic crystal and means for applying to said electrooptic crystal an electric field having an intensity distribution varying along one direction in a plane perpendicular to the direction of light incidence but uniform in the direction normal to said one direction to produce a distribution of refractive index exhibiting a one-dimensional lens action;

a second one-dimensional lens having the same structure as said first one and disposed in such manner that the direction of lens action of said second lens intersects that of said first one at right angles; and

means for changing the electric field applied to said first and

second one-dimensional lenses to change the focal length of the lens action.

4,466,704

PATTERNED POLARIZER HAVING DIFFERENTLY DYED AREAS

Norman W. Schuler, Hyde Park, and Gary T. Scupp, Walpole, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 285,273, Jul. 20, 1981, Pat. No. 4,396,646. This application Jan. 31, 1983, Ser. No. 462,216

Int. Cl.³ G02B 5/30

U.S. Cl. 350—398 5 Claims

1. A light polarizer element comprising a unitary film of a molecularly oriented polymeric material, said film exhibiting a pattern of dichroic-stained areas, at least one of said pattern areas formed by bleaching a first dichroic dye from said film and then restaining the at least one bleached area with a second, different dichroic dye.

4,466,705

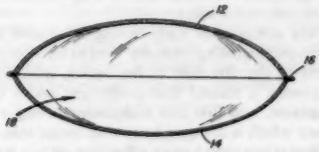
FLUID LENS

Paul E. Michelson, 2280 Calle Tiara, La Jolla, Calif. 92037

Filed Sep. 30, 1982, Ser. No. 432,409

Int. Cl.³ A61F 1/16; G02B 1/06, 3/12; G02C 7/04

U.S. Cl. 350—418 32 Claims



1. A lens comprising

a semipermeable transparent sheath having opposite anterior and posterior portions joined at their edges and forming a closed interior space between themselves;

a body of liquid within said sheath and filling said interior space, said body of liquid constituting an optical lens whose anterior and posterior surfaces are bounded by said anterior and posterior portions of said sheath, respectively, thus defining the anterior and posterior surfaces of the lens; and

means in said body of liquid for producing within said interior space a concentration which is greater than the concentration of a liquid medium in association with which the lens is to be used, in consequence of which when said lens is in contact with such medium, the interior space will be kept filled with liquid under the influence of osmosis which causes the flow of liquid from the exterior of the sheath to the interior thereof whenever the interior space is less than full thereby maintaining the shape of the lens.

4,466,706

OPTICAL FLUID LENS

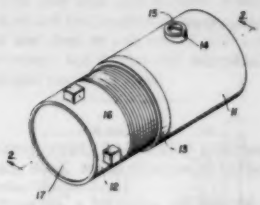
Frederick H. Lamothe, II, R.D. 3, Box 407, Bloomsburg, Pa. 17815

Filed Mar. 10, 1982, Ser. No. 356,823

Int. Cl.³ G02B 3/12, 3/14

U.S. Cl. 350—419 11 Claims

1. An optical lens comprising a pair of telescopically interfitting threaded sleeves adapted for relative movement axially in response to turning, a pair of resilient optical diaphragm elements secured to and closing the outer ends of said sleeves and defining therewith a closed variable chamber, and an optical fluid filling said chamber between said diaphragm elements and being pressurized in varying degrees by adjustments of said sleeves and the pressure of said fluid acting directly on



said diaphragm elements to impart thereto varying degrees of curvature.

4,466,707

VARIABLE MAGNIFICATION LENS SYSTEM

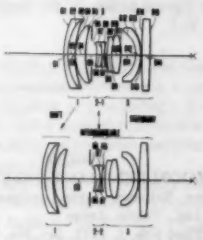
Keiji Ikemori, Kanagawa, and Kazuo Tanaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Mar. 17, 1981, Ser. No. 244,780

Claims priority, application Japan, Mar. 21, 1980, 55-35957; Apr. 11, 1980, 55-47671

Int. Cl.³ G02B 15/02

U.S. Cl. 350—422 8 Claims



1. An interchange type variable magnification objective lens system having an optical axis and in which a lens component is made interchangeable to effect a variation of the focal length, consisting of, from the front to the rear of the lens system in the direction of the optical axis:

a first lens component having a positive refractive power and arranged to be axially movable;

a second lens component having a negative refractive power; and

a third lens component having a positive refractive power;

said lens components being arranged so that when said first lens component is moved along the optical axis, and at the same time said second lens component is replaced by a fourth lens component having a different negative refractive power to that of said second lens component, the focal length of the lens system is varied.

4,466,708

ZOOM LENS

Ellis I. Betensky, New York, N.Y., assignor to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 335,151, Dec. 28, 1981, abandoned. This application Sep. 28, 1982, Ser. No. 423,735

Int. Cl.³ G02B 15/18

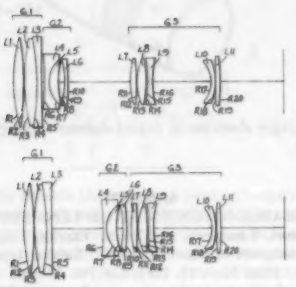
U.S. Cl. 350—427 30 Claims

1. A zoom lens comprising from the object end to the image end a first positive group, said first group comprising a doublet component and a singlet component, said first group being axially movable to focus the lens, a second negative group, said first and second groups being axially movable in predeter-

mined relation to vary the equivalent focal length of the lens; and a third stationary positive group, the zoom lens satisfying the following relations,

$$0.2<F_1/F_L<0.6$$

$$0.2<K_D/K_S<1.6$$



where F_1 is the equivalent focal length of the first groups, F_L is the longest equivalent focal length of the zoom lens, K_D is the optical power of the doublet component of the first group, and K_S is the optical power of the singlet component of the first group.

4,466,709

ZOOM LENS LOCKING SYSTEM

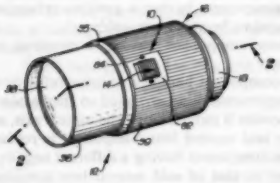
Masami Osawa, Saitama, Japan, assignor to Kino Precision Industries, Ltd., Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,769

Claims priority, application Japan, Sep. 11, 1981, 56-136103[U]

Int. Cl.³ G02B *15/18*

U.S. Cl. 350—429 **20 Claims**



1. In a zoom lens having an operating ring carried about a zoom lens housing and axially movable to adjust the magnification setting of the zoom lens, a locking system for releasably locking the operating ring in a selected position of axial adjustment, comprising:

a cam sleeve carried by the operating ring for axial movement therewith;

means for rotating said cam sleeve with respect to the operating ring in response to axial movement of the operating ring; and

means for selectively locking said cam sleeve against rotation with respect to the operating ring for locking the operating ring against axial movement to adjust the lens magnification setting.

4,466,710

LARGE RELATIVE APERTURE OBJECTIVE LENS

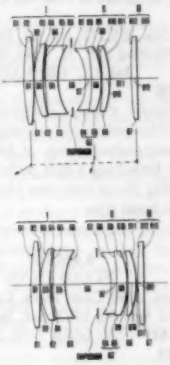
Masatake Kato, Tokyo, and Shigeru Hashimoto, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jun. 16, 1981, Ser. No. 274,312

Claims priority, application Japan, Jun. 18, 1980, 55-82517

Int. Cl.³ G02B *9/62, 13/20*

U.S. Cl. 350—464 **3 Claims**



1. A large relative aperture objective lens system having an optical axis and comprising:

three lens components each having a positive refractive power, and including from the front to the rear of the lens system in the direction of the optical axis, a first lens component, a second lens component and a third lens component, said first lens component having a last lens surface which is concave toward its image side, said second lens component having a first lens surface at its object side which is concave toward the object side;

a diaphragm disposed between said first lens component and said second lens component; and

the components of the system being arranged so that when focusing is effected from an infinitely distant object to a closest object, the first and third lens components are moved in unison forwardly in the direction of the optical axis and the second lens component is simultaneously axially moved forwardly by a smaller amount of movement than the movement of the first and third lens components.

4,466,711

GAUSS TYPE LENS

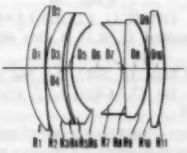
Hideo Yokota, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,419

Claims priority, application Japan, Oct. 9, 1981, 56-161890

Int. Cl.³ G02B *9/60, 9/62, 13/20*

U.S. Cl. 350—464 **2 Claims**



1. A Gauss-type objective, comprising:

a first lens component being a meniscus lens of positive

refractive power with its convex curvature toward an object;

a second lens component arranged on the image side of said first lens component, and being a meniscus lens of positive refractive power with its convex curvature toward the object;

a third lens component arranged on the image side of said second lens component and being a meniscus lens of negative refractive power with its convex curvature toward the object;

a fourth lens component arranged on the image side of said third lens component and being a lens of negative refractive power with its concave curvature toward the object;

a fifth lens component arranged on the image side of said fourth lens component and being a lens of positive refractive power with its convex curvature toward the image; and

a sixth lens component arranged on the image side of said fifth component and comprising at least one lens of positive refractive power;

whereby said objective performs focusing by moving only said fourth, fifth and sixth lens components which are arranged on the image side of a diaphragm and satisfies the conditions:

$$-1.6/f<\alpha_7'<-0.8/f$$

$$0.1/f<\alpha_9'<0.45/f$$

wherein

f represents a focal distance of the whole lens system, α_7' represents a reduced inclination angle of a light ray at a first lens surface of said fourth lens component and α_9' represents a reduced inclination angle of a light ray at a second surface of said fifth lens component.

4,466,712

REAR VIEW MIRROR FOR MOTOR-VEHICLES

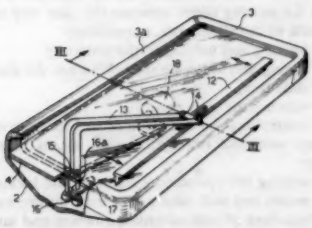
Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Beinasco, Italy

Filed Mar. 31, 1982, Ser. No. 364,036

Claims priority, application Italy, Apr. 7, 1981, 53115/81[U]

Int. Cl.³ G02B *7/18*; B60S *1/08*, *1/24*

U.S. Cl. 350—582 **14 Claims**



1. An external rear view mirror for motor vehicles comprising a body in the form of a shell having a rim, a sheet having a reflecting surface fixed to said body within the rim with the reflecting surface facing outwardly of the body, an attachment member for securing the body of the rear view mirror to a motor vehicle, a support fixed within said body, a stem fixed at one end to said attachment member with the opposite end of said stem projecting into the interior of the body through an opening in the body with the opening having a width permitting to and fro traversing movement of said body with respect to said stem, a pivot member interposed between said support and said opposite end of said stem to define a vertical articulation axis, a pair of abutments carried by said support and said stem, respectively, which are mutually engageable in an angular end-of-path position with respect to the traversing movement of said body, and a kinematic mechanism including a cam rotatably mounted on said support, a projection on said stem in engagement with said cam and resilient means interposed between said stem and said support acting in a direction to bias said body and said sheet to said end of path position of the traversing movement and to bias said cam into engagement with the projection upon said stem.

4,466,713

LENS HOLDING STRUCTURE AND WIRE MATERIAL

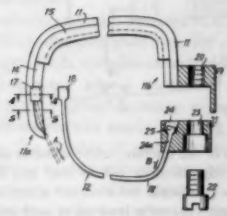
Susumu Tanaka, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,456

Claims priority, application Japan, Sep. 8, 1980, 55-127474

Int. Cl.³ G02C *1/00*, *1/08*, *1/04*

U.S. Cl. 351—106 **6 Claims**



1. A structure for holding a spectacle lens comprising:

an elongated frame member extending across the upper portion of the structure and including a first fixed wire-holding location and a second removeable wire-holding location for mounting the lens onto and removing the lens from the structure; and

a thin wire of a super-elastic Ni-Ti Alloy containing from about 50.5 to 51.5 atomic percent Ni extending from the first fixed wire holding location on the frame member under the lens to the second removeable wire-holding location of the frame member;

wherein said first fixed wire holding region of said frame member for holding said wire includes a hole and a groove extending substantially parallel to the edge of the lens, said wire is received in said groove at one end of the wire and the wire is provided with enlarged end means, said enlarged end means being engaged in said hole, whereby said wire is secured in said hole and groove in said frame member.

4,466,714

APPARATUS FOR LISTING CINEMATOGRAPHIC FILM

Tomas Dyfverman, Vasavägen 8, S-171 39 Solna, Sweden

Filed Apr. 6, 1982, Ser. No. 365,982

Claims priority, application Sweden, Apr. 14, 1981, 8102410

Int. Cl.³ G03B *21/00*

U.S. Cl. 352—129 **7 Claims**

1. An apparatus for listing cinematographic film, comprising means for reversibly feeding the film past an index position;

means connected to said film feeding means for generating electric signals representing each picture frame fed past said index position and the direction in which the film is being fed;

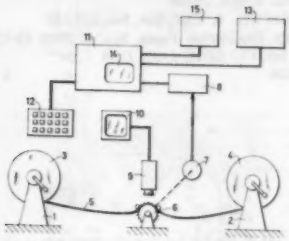
counting means responsive to said electric signals for counting the net number of picture frames fed past said index position in a given direction;

means for visually displaying to an operator an enlarged form of the film section located at the index position at any moment; and

data processing means connected to said counting means and provided with data and instruction input means in the

form of a keyboard, said keyboard comprising a reset key activatable for resetting said counting means to a given initial count value, alphanumeric keys activateable for entering into the data processing means edge numbers provided on the film and appearing on said visual display means when located at said index position, and at least one calculate-and-store key activatable for instructing the data processing means to perform a calculating and storing process;

said data processing mens being operable in response to an activation of said calculate-and-store key to calculate, on



the basis of the current count value in said counting means and the edge number last entered into the data processing means, a positional information alternatingly for the picture frame currently located at said index position at the activation of said calcualte-and store-key and for the picture frame following immediately after the picture frame located at said index position at the last preceding activation of said calculate-and-store key, said positional information being expressed in the edge number most adjacent to the frame concerned and the number of picture frames in between, and to store said calculated positional information in a data storage.

4,466,715

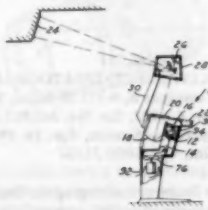
IMAGE PROJECTOR WITH DOUBLE TERMINAL LAMP FIXTURE

Douglas Clark, 29 Shady Hollow, Dearborn, Mich. 48124, and Victor Overby, 1916 N. Walton, Westland, Mich. 48185

Filed Sep. 29, 1982, Ser. No. 427,746

Int. Cl.³ G03B *21/56*

U.S. Cl. 353—45 **5 Claims**



1. A bowling alley score projector including a writing surface, a transparent section in said writing surface, a light source mounted under said writing surface and means for directing light up through said transparent section, and means for directing said light to a screen, said score projector characterized by:

an interior frame positioned below said writing surface;

a one piece U-bracket having two end sections and a bight section removeably connected to said frame;

a lamp holder mounted on each end of said U-bracket and opposing each other for receiving a high intensity light bulb having a terminal at each end thereof;

each lamp holder having a housing section containing a coil spring and a socket being spring biased by said coil spring;

said housing section mounted to said ends of said U-bracket and each socket being spring biased toward each other;

said coil spring in each lamp holder spring biases the socket against a complementary terminal of said light bulb whereby contact between the socket and terminal of the light bulb is assured;

said ends of said bracket having cooling passage means for passing cooling air therethrough; and

means for flowing air through said cooling passage means and about said bulb and U-bracket for cooling said bracket, lampholders, and bulb.

4,466,716

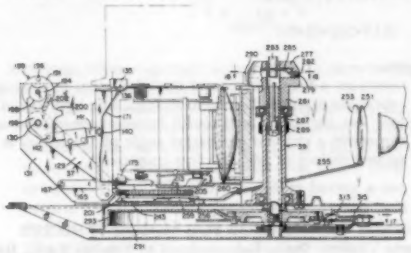
SLIDE PROJECTOR HAVING TWO IMAGE-PROJECTION SYSTEMS WHICH OPERATE WITH A SINGLE SLIDE TRAY

Milo G. Kramer, Mukilteo; Albert S. Ballard, Bothell, and Gideon A. Kramer, Seattle, all of Wash., assignors to Source Technologies Corporation, Mukilleo, Wash.

Filed Jul. 24, 1981, Ser. No. 286,519

Int. Cl.³ G03B *21/20*

U.S. Cl. 353—94 **13 Claims**



1. In a multiple image slide projector which includes a single slide tray for storing slides and first and second image projection systems which each include a slide gate movable between a first position in which slides are loaded and ejected, and a second position in which the slides are projected onto a screen, an apparatus for moving slides between the slide tray and the second position of the slide gates, comprising:

means for locking and unlocking the slide tray;

means for raising and lowering slides between the slide gate and the slide tray;

means for moving the slide tray;

means for controlling the operation of said locking/unlocking means and said raising/lowering means in a fixed sequence;

means for sensing the operational status of said locking/unlocking means and said raising/lowering means; and

means independent of said controlling means and said tray moving means for moving each of the slide gates, independently of each other, when said raising/lowering means is in its lowermost position.

4,466,717

OPTICAL SYSTEM FOR LANTERN SLIDE PROJECTION

Ludwig Meier, Jena; Gebhard Kühn, and Klaus-Dieter Scharf, both of Jena-Lobeda, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Aug. 6, 1981, Ser. No. 290,550

Claims priority, application German Democratic Rep., Oct. 31, 1980, 224866

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—122 **10 Claims**

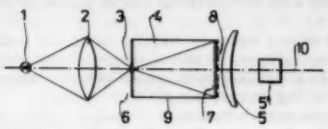
1. An optical system for projection, comprising

(A) a condensing lens,

(B) an objective, and

(C) a reflective resonator, arranged between said condensing lens and said objective, said resonator comprising

(1) a highly reflective surface reflecting toward the objective, said surface being disposed adjacent to said condensing lens,



(2) an opening in said surface for admitting light into the resonator,

(3) a second highly reflective surface opposite said first surface containing an object to be projected, and

(4) at least one substantially totally reflective surface enclosing said first and second surfaces.

4,466,718

AUTOMATIC EXPOSURE CONTROL FOR AUTOMATIC-FOCUS CAMERAS

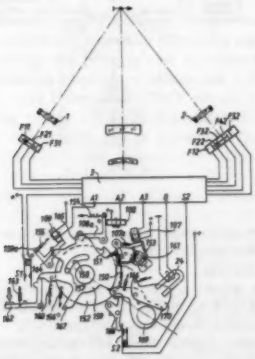
Peter Lermann, Narring; István Cocron, Munich, and Günter Fauth, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 2,932, Jan. 12, 1979, Pat. No. 4,324,463. This application Nov. 12, 1980, Ser. No. 205,976

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801383

Int. Cl.[3] **G03B** *3/10, 7/093*

U.S. Cl. 354—408 **1 Claim**



1. An automatic exposure control for an automatic-focus photographic camera, comprising

an adjustable objective successively adjustable to a number of different subject-distance settings;

an objective adjuster movable to a like number of positions, each position corresponding to a one of the subject-distance settings of the objective;

a control structure movable together with the objective adjuster through said like number of positions;

a subject-distance detector automatically identifying which of the subject-distance settings best corresponds to a distance to a subject being photographed, the subject-distance detector including:

(a) a first photodetector array fixed to the camera and including a first plurality of adjoining photodetectors,

(b) a second photodetector array fixed to the camera and including a second plurality of adjoining photodetectors, the second plurality exceeding the first plurality by a number dependent upon the number of different subject-distance settings of the objective,

(c) first optical means fixed to the camera and operative for projecting an image of a subject onto the first photodetector array in such a manner as to prevent any substantial shift between such projected image and the photodetectors in the first photodetector array for any subject-distance settings to which the objective may be adjusted,

(d) second optical means fixed to the camera and operative for projecting another image of said subject onto the second photodetector array in such a manner as to induce a shift between the projected image and the photodetectors of the second photodetector array with such shift being dependent upon that one of the subject-distance settings which corresponds to objective distance to said subject,

(e) a signal-evaluating circuit connected to all photodetectors in the first and second photodetector arrays in such a manner as to divide the photodetectors in the second photodetector array into a successive plurality of groups, each such group including a like number of adjoining photodetectors and overlapping an adjoining group by a like number of photodetectors, whereby each such group corresponds to a respective one of the subject-distance settings of the objective,

the signal-evaluating circuit furthermore including a comparator and a comparison evaluator, the comparator performing a plurality of comparisons, in which plurality each comparison compares output signals produced by the photodetectors of the first photodetector array with output signals produced by the photodetectors in a corresponding group of photodetectors in the second photodetector groups

and the comparison evaluator selecting that one of the comparisons in which such output signals best approximate each other, said comparison evaluator having as many outputs as many successive groups are present in the second photodetector array, whereby a group corresponding to a best subject-distance setting of the objective is identified by a signal at one of said outputs;

a spring-powered drive and arrest mechanism including a plurality of like electromagnets connected to said outputs, the drive and arrest mechanism urging the objective adjuster and the control structure to move together through said positions successively, the electromagnets arresting the objective adjuster in accordance with that subject-distance setting which has been identified by the comparison evaluator while leaving the control structure unarrested and free to continue to move through further positions successively;

a shutter;

a shutter trigger causing the shutter to open when the control structure reaches one of said further positions past that position at which the objective adjuster is arrested;

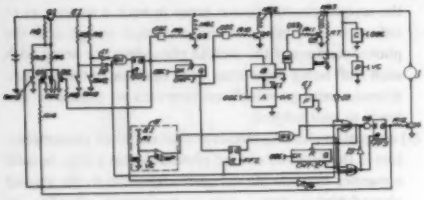
an electronic exposure timer for timing an exposure, the exposure timer including a summer connected to each of the photo-detectors in the second photodetector array for generating a sum signal corresponding to the reciprocal of the number of photodetectors contained in the second photodetector array, said sum signal being characteristic of prevailing light intensity at a subject being photographed; and

a start switch starting the exposure timer when the objective adjuster and control structure reach a predetermined position.

4,466,719
WIND-UP DEVICE FOR CAMERA

Shosuke Haraguchi; Masanori Uchidoi, both of Kanagawa; Yoshihiro Shigeta, Tokyo; Ryoichi Yoshikawa, Kanagawa, and Yoichi Tosaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 295,327, Aug. 24, 1981, abandoned. This application May 16, 1983, Ser. No. 494,628
Claims priority, application Japan, Aug. 28, 1980, 55-118619
Int. Cl.³ G03B *1/18, 17/42*
U.S. Cl. 354—173.11 **8 Claims**

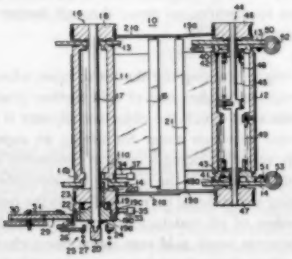


1. A wind-up device for a camera, comprising:
driving means for effecting film winding and shutter charging;
control means for controlling the driving action of said driving means, said control means being arranged to bring said driving means into a driving state when a first signal is applied thereto and to render the driving means incapable of driving when a second signal is applied;
first signal generating means for producing said first signal upon completion of an exposure effecting operation;
second signal generating means for producing said second signal upon completion of a winding operation;
switch means for causing said first signal generating means to produce the first signal therefrom irrespective of completion of the exposure effecting operation; and
operation means for causing said switching means to perform the switching action thereof.

4,466,720
FOCAL-PLANE SHUTTER

Akihiko Hashimoto, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,746
Claims priority, application Japan, May 19, 1981, 56-75385; May 19, 1981, 56-75386; May 19, 1981, 56-75387; May 19, 1981, 56-75388; May 19, 1981, 56-75389; May 19, 1981, 56-72045[U]; May 19, 1981, 56-72046[U]
Int. Cl.³ G03B *9/34*
U.S. Cl. 354—244 **23 Claims**

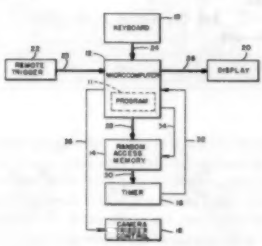


1. In a focal-plane shutter comprising:
leading and trailing screens;
first leading and trailing cylinders rotatably disposed on the winding side of the shutter and coupled to the leading and trailing screens, respectively;
second leading and trailing cylinders rotatably disposed on the charge side of the shutter and coupled to the leading and trailing screens, respectively;
first driving means for rotating the first leading and trailing cylinders so that the first leading and trailing cylinders are wound with the leading and trailing screens, respectively; and
second driving means for rotating the second leading and trailing cylinders at shutter release so that the second leading and trailing cylinders are wound with the leading and trailing screens, respectively,
the improvement wherein:
said first and second leading cylinders are substantially coaxial with said first and second trailing cylinders, respectively; and
position regulating means is coupled between said first leading and trailing cylinders for directly supporting and regulating the positions of said first leading and trailing cylinders so that they are maintained substantially coaxial with each other, said position regulating means including a support plate provided between said first leading and trailing cylinders for directly supporting said first leading and trailing cylinders.

4,466,721
TIME LAPSE PROGRAMMER

Gregory Detuzzi, 267 Dayton Rd., Bridgeport, Conn. 06606

Filed Mar. 30, 1983, Ser. No. 480,509
Int. Cl.³ G03B *17/40*
U.S. Cl. 354—267.1 **10 Claims**



1. Programmable apparatus for controlling a camera during time lapse photography comprising:
a microcomputer;
data entry means coupled to said microcomputer for enabling a user to program an exposure duration, and a plurality of different exposure intervals;
display means coupled to said microcomputer for prompting a user to enter exposure duration and interval data, and for displaying the data entered by the user;
random access memory operatively associated with said microcomputer;
means for loading said exposure duration and interval data into said random access memory;
a timer;
means for loading a first user programmed exposure interval from said random access memory into said timer and actuating said timer to output a control signal at the end of a time period defined by said exposure interval;
means for loading exposure duration data from said random access memory into said timer in response to said control signal;
means responsive to said timer for providing a camera trigger signal for a time period defined by said exposure duration data; and
means for loading successive user programmed exposure interval and exposure duration data from said random

access memory to said timer to produce successive camera trigger signals in accordance with the remaining exposure interval and duration data stored in said random access memory.

4,466,722

FILM DEVELOPING APPARATUS HAVING CONTINUOUS CIRCULATION OF DEVELOPING LIQUIDS

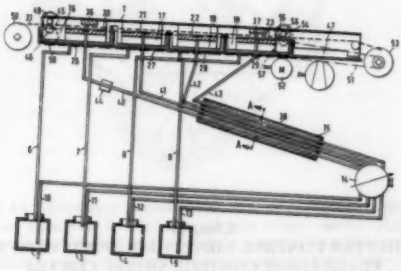
Eckhardt Staude, Woelfersheim, Fed. Rep. of Germany, assignor to Firma Eva Staude, Woelfersheim, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,307

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213416

Int. Cl.³ G03D *3/06*

U.S. Cl. 354—299 **14 Claims**



1. An apparatus for the development of microfilm comprising:

a plurality of work stations arranged along a work path;

a horizontal track for transporting film along the work path;

means for moving said film in said horizontal track said means including a plurality of rollers and a drive motor;

a plurality of fluid flow circuits each circuit comprising a fluid holding vessel, a suction line, means for providing suction in said suction line, a pressure line, means for providing pressure in said pressure line, means for heating said pressure line, a bath disposed in at least one of said work stations, means for spraying said film in said bath, a liquid and film guiding body in said bath and return conduit from said bath to said fluid holding vessel.

4,466,723

ELECTROMAGNETIC DRIVE DEVICE

Hideo Ikari, and Michio Hirohata, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,381

Claims priority, application Japan, Sep. 24, 1981, 56-151267

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—400 **9 Claims**

1. An electromagnetic drive device for a camera, comprising:

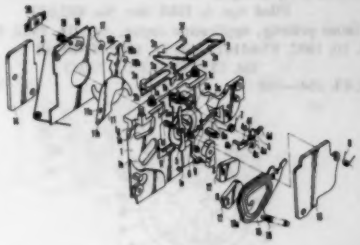
a plurality of coils disposed within a magnetic field and arranged to produce an electromagnetic driving force when a power supply is effected thereto;

a driving member including said coils and being arranged to be operated by said electromagnetic driving force;

a plurality of blade members which perform opening and closing actions for effecting an exposure in response to the operation of said driving member;

an exposure participating mechanism other than said blade members, said mechanism being controlled by an action of said driving member similar to the action thereof performed for opening and closing the blade members;

holding means for holding the blade members in a closed state while said driving member is performing the control action on said exposure participating mechanism; and



control means for actuating said holding means, said control means being arranged to operate independently of the operating state of said driving member.

4,466,724

RELEASE CONTROL DEVICE FOR CAMERA

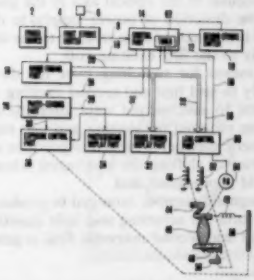
Makoto Masunaga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,563

Claims priority, application Japan, Jun. 26, 1981, 56-100166; Jun. 30, 1981, 56-102014

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—402 **6 Claims**



1. A release control device for a camera having a shutter button comprising:

(a) release means having a first switch which is changed from a first state to a second state by pressing the button to a first position and a second switch which is changed from a first state to a second state by pressing the button to a second position;

(b) timer means for initiating a time count when the second switch is changed from the first state to the second state and for counting at least for a predetermined length of time;

(c) detection means for detecting that the counting time of the timer means reaches the predetermined length of time;

(d) a range finding device which initiates a range finding operation when the first switch is changed from the first state to the second state;

(e) switchover means for changing the length of time of the time count by the timer means to a predetermined length of time when the range finding device completes the range finding operation; and

(f) means for producing a signal for carrying out another camera operation when the detection means detects that the time count of the timer means has reached the predetermined time.

4,466,725

ELECTROMAGNETIC DRIVE DEVICE FOR CAMERA

Michio Hirohata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,627
Claims priority, application Japan, Apr. 16, 1982, 57-64146; Apr. 16, 1982, 57-64147; Apr. 16, 1982, 57-64148
Int. Cl.³ G03B 3/02, 7/085
U.S. Cl. 354—403 8 Claims

1. An electromagnetic drive device for a camera, comprising:

(a) a lens barrel having a light quantity control member and a photo-taking lens arranged therein, said lens barrel being arranged to be shiftable in the direction of the optical axis of said lens;

(b) first and second exciting coils disposed at the lens barrel, said first and second exciting coils being arranged to produce a first magnetic field in a direction parallel to the optical axis of the photo-taking lens when the direction of power supply to the second exciting coil is in a first state relative to the direction of power supply to the first exciting coil and to produce a second magnetic field in a direction perpendicular to the optical axis of the photo-taking lens when the direction of power supply to the second exciting coil is in a second state relative to the direction of power supply to the first exciting coil;

(c) switching means for switching over the directions of power supply to said first and second exciting coils from said first state to said second state after the lapse of a period of time required for shifting said lens barrel;

(d) a first magnetic member arranged to produce an electromagnetic force for shifting the lens barrel when said first magnetic field is produced; and

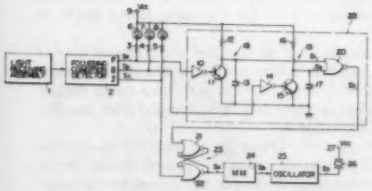
(e) a second magnetic member arranged to produce an electromagnetic force for actuating said light quantity control member when said second magnetic field is produced.

4,466,726

IN-FOCUS INDICATOR FOR A CAMERA

Yukio Nakajima, Kanagawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,178
Claims priority, application Japan, May 20, 1981, 56-76355
Int. Cl.³ G03B 3/00
U.S. Cl. 354—409 11 Claims



1. An in-focus indicator for a camera, comprising:

a focussing condition detector responsive to the optical image of an object being photographed which is projected onto a film surface, by producing at least three status signals including a forward focussing signal, a backward focussing signal and an in-focus zone signal;

means for generating a set signal in response to a change in the focussing signals being produced;

a set signal save circuit adapted to be set by the set signal from said generating means and reset by the interruption of the in-focus zone signal;

an oscillator responsive to the set output from the set signal save circuit by being activated for a given time interval; and

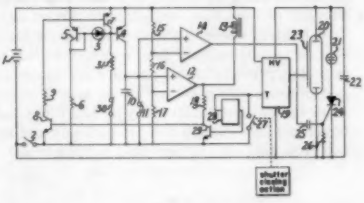
an element responsive to an output from the oscillator by producing sound only when an in-focus position is reached from either a forward focussing or a backward focussing condition which is outside the in-focus zone.

4,466,727

SHUTTER CONTROL CIRCUIT EQUIPPED WITH A FLASH LIGHT CONTROL SIGNAL CIRCUIT

Shinji Nagaoka, and Koji Sato, both of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,197
Claims priority, application Japan, Feb. 23, 1981, 56-25114
Int. Cl.³ G03B 7/083, 15/05
U.S. Cl. 354—417 5 Claims



1. In a photographic camera having a triggerable flash system and operable in an automatic flash exposure mode for automatically controlling the exposure operation of a shutter in dependence on the light received from an object field being photographed: light sensing means for sensing the light received from the object field and producing a corresponding output current signal proportional to the object field brightness; shutter control circuit means for integrating the output current signal and producing a shutter closing signal to initiate closing of the shutter in dependence on the integrated value of the output current signal attributable to ambient light received from the object field to thereby control the shutter operation; and flash control circuit means responsive to the shutter closing signal for temporarily interrupting the integration of the output current signal and thereafter effecting resumption of the integration of the output current signal in synchronism with the triggering of the flash system and operative to control the flash operation in dependence on the integrated value of the output current signal attributable to both ambient light and flashlight received from the object field.

4,466,728
DEVICE FOR THE DEVELOPMENT OF CHARGE IMAGES, WHICH ARE ARRANGED ON A CHARGE IMAGE CARRIER, WITH THE AID OF A DEVELOPING MIXTURE CONSISTING OF TONER AND CARRIER PARTICLES

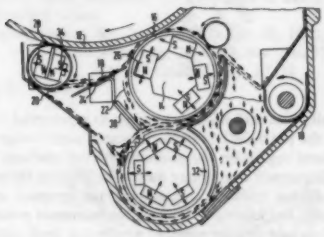
Bernhard Schlageter, Ottobrunn, and Manfred Maier, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 6, 1982, Ser. No. 375,458

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3119029

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD **4 Claims**



1. In a developer station having a housing formed with an upper open end for facing a charge image carrier passing through said station and containing a body of developer mix including toner and carrier particles and a rotary developer drum for conducting developer mix from said body to an inking gap between said developer drum and said carrier for developing charge images generated on said carrier, apparatus for preventing the emergence of mix dust from within said housing through said open upper end comprising:

a guide plate extending generally laterally between said developer drum and an upstanding housing sidewall,

said guide plate having a lead end disposed adjacent the developing drum downstream of said inking gap and a trail end disposed adjacent said housing sidewall,

said lead end dividing developer mix passing through said inking gap on said developer drum into a first branch flow passing between said lead end and said developer drum and a second branch flow along said guide plate passing between said trail end and housing sidewall, and

a fixed magnet means disposed in said developer drum adjacent said lead end for promoting the flow of developer mix in said first branch flow.

4,466,729
IMAGE FORMING APPARATUS

Yasuhiro Iwata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 426,753

Claims priority, application Japan, Dec. 23, 1981, 56-208315

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 CH **15 Claims**

1. An image forming apparatus comprising:

a housing including a first unit and a second unit swingably supported to the first unit;

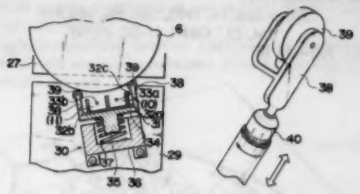
a photosensitive body housed in the housing and rotatably supported by the second unit;

a fixed member attached to the second unit and having a fixed position relative to the photosensitive body; and

a corona charging device provided in the first unit and including:

a corona charger provided with a base member fixed to the first unit and facing the photosensitive body, a case attached to the base member, being movable between the photosensitive body and the base member and opening to the photosensitive body and a charging wire housed in the case, said charging wire and photosensitive body being adapted to be connected to a power supply,

urging means for moving the case in one direction toward the photosensitive body, and



a positioning member fixed to said corona charger and being in contact with said fixed member to move the corona charger in a direction opposite to said one direction against the urging means when the second unit is swung to close the housing, thereby defining the position of the corona charger relative to the photosensitive body.

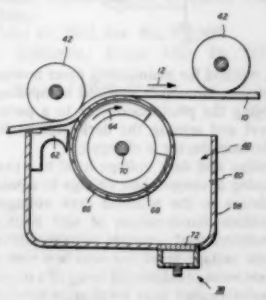
4,466,730
DEVELOPMENT APPARATUS

Don B. Jugle, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1982, Ser. No. 448,141

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **8 Claims**



1. An apparatus for developing an electrostatic latent image recorded on a photoconductive member, including:

means, defining a chamber, for storing a supply of developer material comprising at least carrier granules and toner particles therein;

a tubular member mounted rotatably in the chamber of said storing means for transporting the developer material closely adjacent to the electrostatic latent image recorded on the photoconductive member;

means for attracting developer material to said tubular member;

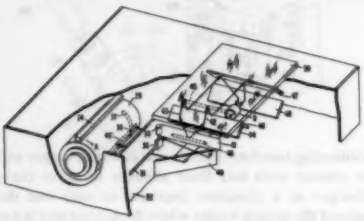
a blade member having a plurality of apertures therein with the free end portion of said blade member being spaced from said tubular member to define a gap therebetween for controlling the thickness of the layer of developer material adhering to said tubular member; and

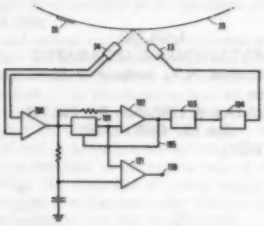
means for reducing the pressure in the chamber of said storing means so that at least the toner particles accumulating on said blade member flow through the apertures therein returning to the chamber of said storing means.

4,466,731
ELECTROPHOTOGRAPHIC MACHINE WITH HIGH DENSITY TONER CONCENTRATION CONTROL

James R. Champion, and Robert W. Pries, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,810
Int. Cl.³ G03G 15/00, 15/08
U.S. Cl. 355—14 D 14 Claims





1. A method for maintaining toner concentration in an electrophotographic copier machine comprising the steps of:

charging the photoconductor to a particular dark voltage level and sensing the dark voltage level to which said photoconductor is charged;

adjusting said dark voltage level to a predetermined value;

adjusting developer bias voltage to a predetermined level in relation to the adjusted dark voltage level in order to produce development of said photoconductor with a predetermined constant voltage difference between said dark voltage level and said bias voltage level, said constant voltage difference being of a magnitude to produce a predetermined gray level upon development when toner concentration is nominal;

developing said photoconductor to produce gray toner density level;

sensing the density of said gray toner level; and

adjusting toner concentration in accordance with the sensed density.

4,466,732
DEVELOPMENT SYSTEM HAVING A BOUNDED ELECTRICAL BIAS

Jeffrey J. Folkins, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

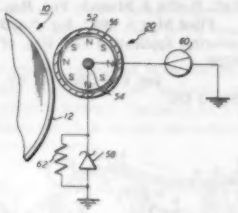
Filed Jun. 28, 1982, Ser. No. 392,964
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 D 7 Claims

1. An electrophotographic printing machine of the type having an electrostatic latent image and a background region on a photoconductive surface, wherein the improvement includes:

a tubular member mounted rotatably for moving a dry developer material comprising at least carrier granules and toner particles closely adjacent to the photoconductive surface so that the electrostatic latent image attracts toner particles thereto forming a toner powder image on the photoconductive surface;

means for attracting the developer material to said tubular member; and

means for controlling the charge induced on said tubular member by the charge on the photoconductive surface to

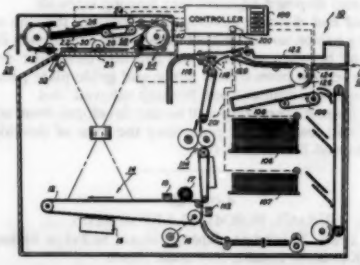


electrically bias said tubular member to a potential intermediate the potential of the electrostatic latent image and background region on the photoconductive surface, said controlling means comprising means for limiting the maximum potential induced on said tubular member to an upper limit, and means for limiting the minimum potential induced on said tubular member to a lower limit relative to the photoconductive surface.

4,466,733
HIGHER PRODUCTIVITY RECIRCULATIVE DOCUMENT COPYING

Susan J. Pels, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 10, 1982, Ser. No. 448,654
Claims priority, application European Pat. Off., Sep. 21, 1982, 82304965.5; Sep. 21, 1982, 82304964.8
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 R 2 Claims



1. In a method or recirculatively precollatively copying a set of plural simplex original documents onto both sides of copy sheets to produce a desired plural number precollated duplex copy sheet sets, by normally copying the documents only once in each copying circulation of the document set, and by forming a buffer set of copies of alternate document pages being duplexed which buffer set copies are printed on only one side, and temporarily stored in a duplex store and by copying alternate documents onto the opposite sides of the buffer set copies in proper sequence to form collated duplex copy sets, and wherein said documents are all copied unidirectionally in reverse (N to 1) page order, the improvement comprising:

counting the number of documents in the document set and determining that said number of documents is more than three but less than approximately ten,

in response to said determination, automatically switching

the mode of copying said document sheets to a higher productivity small document set mode comprising the steps of initially building two complete and identical said buffer sets of alternate page documents on two initial copying circulations of said document set and placing both said identical buffer sets in the same duplex store and then stopping the copying of said alternate document pages in said two buffer sets in the final two copying circulations of said document set to deplete said two buffer sets.

4,466,734

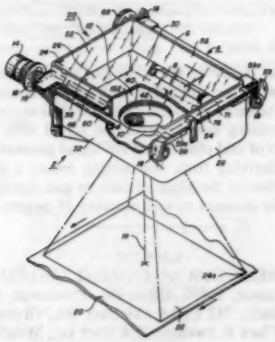
COMPACT FULL FRAME ILLUMINATION AND IMAGING SYSTEM FOR A PHOTOCOPIER

James D. Rees, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 372,581, Apr. 28, 1982, abandoned. This application Sep. 26, 1983, Ser. No. 536,144

Int. Cl.³ G03B *27/36, 27/38*

U.S. Cl. 355—58 **11 Claims**



1. A compact, flash illumination and imaging optical system for a photocopier comprising in combination:

a platen member for supporting original documents to be copied;

an enclosed illumination housing positioned beneath said platen member, said housing having diffuse, highly reflective interior surfaces;

a flash illumination means within said illumination housing adapted for periodically providing a generally uniform level of illumination at said platen surface,

a wide angle, relative-illumination compensated lens movably mounted in the floor of said housing for projecting document images along an unfolded optical path onto a photosensitive image plane; and

means for changing the magnification of said optical system, said means including a first means for changing the platen-to-image plane conjugate and a second means for translating said lens along a non-linear path towards and away from said image plane to project the document image onto the image plane at the desired magnification while maintaining document registration.

4,466,735

HALF TONE SCREEN EXPOSURE APPARATUS

Erik K. Nelson, Fairport, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Jul. 29, 1982, Ser. No. 403,205

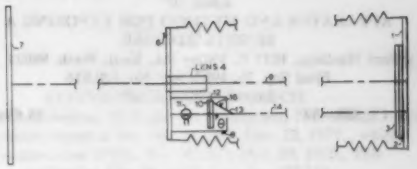
Int. Cl.³ G03B *27/72*

U.S. Cl. 355—71 **20 Claims**

1. In a graphic camera having a copyboard, a film platen for positioning a photosensitive sheet and a half-tone screen thereover, together with a main projection lens positioned upon a projection optical axis for focusing images of objects upon said copyboard at said film platen, the improvement comprising an auxiliary projection device positioned off axis with respect to said main projection optical axis and upon a second optical axis separate from said first optical axis for exposing said photosensitive sheet to light, said projection device further comprising:

a. a light source positioned at one portion of said auxiliary projection device;

b. a light transmitting aperture positioned at a second portion of said auxiliary projection device upon said second optical axis; and



c. light diffusion means, optically intermediate said light source and said aperture, having a variable density pattern associated therewith, said pattern including a plurality of light attenuating arcuate lines, the spaces between said arcuate lines continuously increasing in a manner to cause said film platen to be uniformly illuminated by light passing through said aperture upon the actuation of said light source.

4,466,736

ORIGINAL PRESSING DEVICE

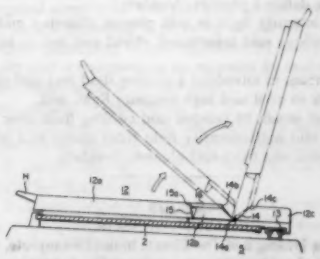
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1982, Ser. No. 378,007

Claims priority, application Japan, May 26, 1981, 56-77090[U]

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **6 Claims**



1. An original pressing device comprising:

an original pressing plate having a mounting portion, an intermediate portion and a pressing portion;

a first bending portion provided between said mounting portion and said intermediate portion;

a second bending portion provided between said intermediate portion and said pressing portion;

mounting means for mounting said mounting portion on an original supporting table;

first abutting portions located on the facing sides of said intermediate portion and said mounting portion near said first bending portion to control the opening angle of said intermediate portion relative to said mounting portion through said first bending portion and to cause said intermediate portion to self-support in the open position; and

second abutting portions located on the facing sides of said

pressing portion and said intermediate portion near said second bending portion to control the opening angle of said pressing portion relative to said intermediate portion through said second bending portion and to cause this pressing portion to self-support in the open position;

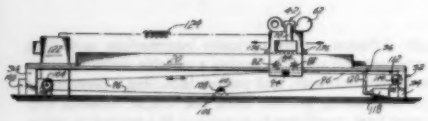
wherein at the time of self-support, the angle between said intermediate portion and said mounting portion, as viewed from their abutting side, is smaller than the angle between said pressing member and said intermediate portion, as viewed from their abutting side.

4,466,737

APPARATUS AND METHOD FOR EXPOSING A SENSITIZED BASE

Lynford Hastings, 1817 E. Valley Rd., Kent, Wash. 98031

Filed Sep. 21, 1982, Ser. No. 420,816
Int. Cl.³ G03B *27/10*
U.S. Cl. 355—84 **18 Claims**



1. An easel for use in the copying of an object, said easel comprising:

a. a support;

b. said support being capable of receiving an object;

c. a vacuum means for positioning said object on said support;

d. a light source;

e. a moving means for moving said light source over said support;

f. said light source comprising a housing;

g. said housing having side walls and a top wall defining an opening in the lower part;

h. a translucent shield operatively connecting with said side walls to define a plenum chamber;

i. a high intensity light in said plenum chamber and positioned above said translucent shield and below said top wall;

j. a first means to introduce a cooling fluid into said plenum chamber to cool said high intensity light; and,

k. a second means to remove said cooling fluid after it has cooled said high intensity light from above said translucent shield and from said plenum chamber.

4,466,738

VIBRATION SENSOR

Cheng-Chung Huang, and Tao Chang, both of Sunnyvale, Calif., assignors to Lockheed Missiles & Space Co., Sunnyvale, Calif.

Filed Aug. 23, 1982, Ser. No. 410,515
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—4.5 **6 Claims**

1. Interferometric apparatus for measuring the distance to a plurality of surfaces comprising:

means for providing a coherent light beam at a single frequency V_o,

means for splitting said coherent light beam into a first and second part and producing a frequency shift of V_a in said first part of said coherent light beam to produce a coherent light beam having a frequency of V_o+V_a,

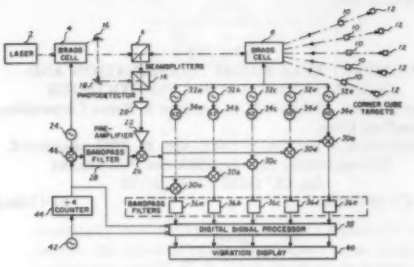
coherent light deflection means for receiving one part of the split coherent light beam,

a plurality of RF signal generating means, said plurality of RF signal generating means operably connected to said coherent light deflection means to cause said coherent light deflection means to fan said one part of the split coherent light beam into a plurality of coherent light beams,

means for expanding and reflecting back each of said plurality of coherent light beams to said light deflection means,

said light deflection means recombining said plurality of coherent light beams,

photosensitive detective means for receiving said recombined coherent light beam, said photosensitive detective



means also receiving the other part of said split coherent light beam for heterodyning with said recombined coherent light beam to produce a heterodyned signal,

means for mixing said heterodyned signal with an output from each of said plurality of RF signal generating means,

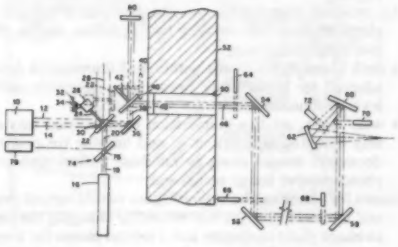
means for deriving from said mixing means a plurality of signals whereof the phase of each of said signals is a measure of the distance to said plurality of targets.

4,466,739

LASER BEAM ALIGNMENT SYSTEM

William H. Kasner, 11686 Althea Dr., Pittsburgh, Pa. 15235; Daniel J. Racki, 712 Union Cemetery Rd., Greensburg, Pa. 15601, and Clark E. Swenson, 228 Scott Dr., Monroeville, Pa. 15146

Filed Feb. 26, 1982, Ser. No. 352,744
Int. Cl.³ B23K *26/02*
U.S. Cl. 356—138 **5 Claims**



1. A laser beam alignment system comprising:

a first laser projecting a first high-power beam along a first path;

a second laser projecting a second low-power beam along a second path disposed transverse to and intersecting said first path;

a first reflector removably positionable on said first path and operative, when thereon, to (1) divert a portion of said first beam along a third path disposed transverse to said first path, (2) pass the remainder of said first beam along said first path, and (3) reflect said second beam along said first path;

a second reflector positioned on said first path for reflecting said first and second beams along a fourth path transverse to said first path;

a third reflector removably positionable on said fourth path and operative, when thereon, to reflect said first and second beams along a fifth path disposable at different angles relative to said fourth path;

a fourth reflector removably positionable on said fifth path and operative, when thereon, to reflect said first and second beams along a sixth path disposable at different angles relative to said fifth path;

a target reflector removably positionable on said fifth path between said third and fourth reflectors and operative, when thereon, to reflect a portion of each of said first and second beams back to said third reflector, second reflector, and first reflector in that order; and

means for viewing portions of said first and second beams reflected from said target reflector back to said first reflector and thence along said second path.

4,466,740

PARTICLE AGGLUTINATION ANALYZING PLATE

Tokio Kano, Akishima, and Akira Tamagawa, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

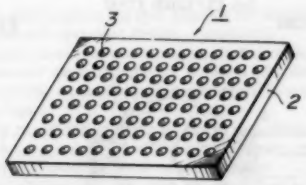
Filed Oct. 7, 1981, Ser. No. 309,414

Claims priority, application Japan, Oct. 9, 1980, 55-141175

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ G01N *1/10*

U.S. Cl. 356—246 **15 Claims**



1. A particle agglutination analyzing plate, comprising:

a plurality of reaction vessels, each having an inclined bottom surface, formed in said plate;

a plurality of steps formed in the bottom surface of each of said reaction vessels, said steps having a dimension measured perpendicularly to the inclined bottom surface of 2 to 5 μm and a pitch measured in the inclined bottom surface of 5 to 200 μm.

4,466,741

MIXING ELEMENT AND MOTIONLESS MIXER

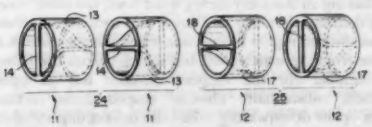
Hisao Kojima, 3-53-21, Shioiri-cho, Tsurumi-ku, Yokohama-shi, Japan

Filed Dec. 29, 1982, Ser. No. 454,283

Claims priority, application Japan, Jan. 16, 1982, 57-4023; Jan. 26, 1982, 57-9596; Apr. 12, 1982, 57-59796; Oct. 9, 1982, 57-176988

Int. Cl.³ B01F *5/00*

U.S. Cl. 366—339 **21 Claims**



1. A mixing element for a motionless mixer without a mechanical moving part whereby two or more fluids are mixed as the fluids flow through said motionless mixer, said mixing element comprising:

a cylindrical passage tube through which the fluids flow, said passage tube having two end faces; and

a helical blade formed in the passage tube so as to be integral therewith,

the interior of said passage tube being partitioned by said blade to form a plurality of fluid passages,

wherein said end faces of said passage tube have outer and inner annular projections, respectively, whereby the mixing element is coupled to other mixing elements by fitting said outer and inner annular projections thereof.

4,466,742

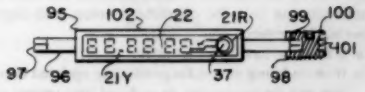
ELECTRONIC DIGITAL WATCH

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 863,256, Dec. 22, 1977, , which is a continuation of Ser. No. 643,327, Dec. 22, 1975,. This application Feb. 26, 1982, Ser. No. 352,710

Int. Cl.³ G04B *47/00*

U.S. Cl. 368—10 **6 Claims**



1. A writing implement including electrically energized means for keeping and displaying time comprising:

an elongated tubular barrel having a first opening at one end thereof and closure means for said first opening,

a writing device secured within said barrel and having a writing tip portion projecting from the other end of said barrel,

an electrical circuit means and a battery connected to power said electrical circuit means,

an elongated support for said electrical circuit means,

display means including a plurality of variably operable character generating means supported by said elongated support and connectable to be operated by said electrical circuit means so as to display time,

a second opening to said barrel,

means for removably securing said battery to said support for said circuit means in alignment with said second opening to permit said battery to be removed and replaced through said second opening,

a first retaining means for said support located within said barrel for holding said support and means for securing said first retaining means to a wall of said barrel,

a transparent lens disposed across and closing said second opening,

said transparent lens being removably secured to said barrel across said second opening,

said support for said electrical circuit means being supported by said retaining means to position said display means in alignment with said second opening when said retaining means is operatively located in said barrel whereby the time displayed by said display means may be viewed through said transparent lens from the exterior of said barrel,

said battery being removably secured within said barrel, and

means for electrically connecting said battery to said electrical circuit means when said support for said electrical circuit means is operatively located in said barrel and said battery is operatively located and retained against said support for said circuit means.

4,466,743

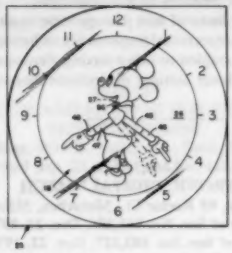
ELECTRONIC AUDIO-VISUAL TIMEPIECE

Norbert M. Puff, 427 Catalina Dr., Newport Beach, Calif. 92663

Filed Dec. 16, 1982, Ser. No. 446,642

Int. Cl.³ G04B *21/08*; G04C *19/00*

U.S. Cl. 368—63 **6 Claims**



1. An electronic audio-visual timepiece which incorporates a synthetically produced voice of a character to audibly tell the time and an animated display of the character so that the character's body movements visually indicate the time and are in sychronization with the character's voice, said electronic audio-visual timepiece comprising:

a. a housing having a face plate;

b. time updating means for producing updated time information and for generating an updated time output signal, said time updating means being disposed in said housing;

c. processing means for processing said updated time output signal and for generating an audio drive input signal and a visual drive input signal, said processing means being disposed in said housing;

d. speech generating means for generating the synthetically produced voice of the character in a predetermined speech pattern in order to audibly tell the time in response to said audio drive input signal, said speech generating means being disposed in said housing; and

d. visually displaying means for visually displaying the character's body movements in order to visually indicate the time in response to said visual drive input signal, said visually displaying means being disposed in said housing, wherein the character's body movements are in sychronization with the character's voice.

4,466,744

STRIKING CLOCK INCLUDING DEVICE FOR SELECTIVELY AND/OR TEMPORARILY PREVENTING THE GONG OR BELL FROM BEING STRUCK

Rolf Hepfer, Bad Dürrheim, and Jürgen Rünzler, Spaichingen, both of Fed. Rep. of Germany, assignors to Joseph Kieninger GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,336

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148853

Int. Cl.³ G04B *23/00*

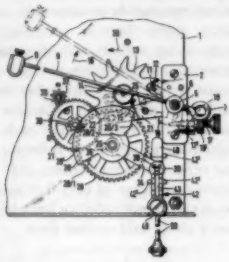
U.S. Cl. 368—262 **17 Claims**

1. A device for preventing the striking of a clock having a striking mechanism including a hammer shaft movable for striking of the clock comprising:

an engaging lever co-rotationally connected to the hammer shaft and movable in a path during striking of the clock;

a rotatably mounted detent disc having at least a portion in the path of said engaging lever for at least a selected duration to prevent striking of the clock;

disc drive means connected to said disc for rotating said disc at a rate to establish said selected duration; and



a manually displaceable member movable into a first position in the path of said engaging lever for preventing striking of the clock at all times.

4,466,745

CASING FOR A WATCH TO BE WORN ON THE BODY

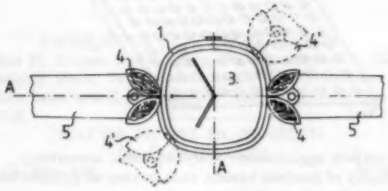
Jean E. Eichmann, Onex-Geneva, Switzerland, assignor to Heinz Hermann Weick, Geneva, Switzerland

Filed Nov. 2, 1981, Ser. No. 317,488

Claims priority, application Switzerland, Nov. 3, 1980, 8142/80

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—281 **4 Claims**



1. A casing for a watch which is to be worn on the body, said casing comprising:

a watch shell in the form of a ring including a tongue portion extending outwardly from the periphery of the shell;

a support member for carrying the watch on the body, said support member having an end;

a fixing axis member for receiving and engaging the end of the support member;

a connecting member which is removably fitted from the top of the shell to said tongue portion in overlying relationship therewith and which is secured in position transversely with respect to the direction of fitting by complementary shaped surfaces provided on the connecting member and on the tongue portion, said connecting member having a pair of spaced, depending side walls to surround said tongue portion and to define a slot to receive a longitudinal portion of said tongue portion, said side walls each having an inwardly facing blind bore, the blind bores being coaxial to receive said fixing axis member, wherein at least the end region of the connecting member which is remote from the watch shell and which carries the fixing axis member for the support member has an open mouthed, substantially channel shaped cross section which opens downwardly when the connecting member is fitted on the tongue portion, towards the bottom of the tongue portion and casing, and wherein the end region of the tongue portion remote from the watch shell operatively extends into the channel-shaped cross section of the

connecting member and at least partially overlies the fixing axis member to secure the connecting member to the tongue portion in a direction opposite to the direction in which it is fitted on the tongue member.

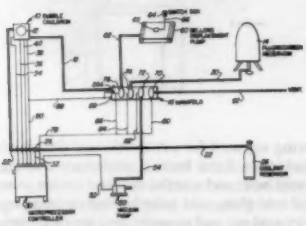
4,466,746

EBULLIOMETRIC HOT SPOT DETECTOR

Robert D. Hancock, 475 Lakeshore Dr., Chrystal Bay Cove, Unit 32, Incline Village, Nev. 89450, and Kenneth F. Hollman, San Marcos, Calif., assignors to Robert D. Hancock, Incline Village, Nev.

Filed Dec. 1, 1981, Ser. No. 326,224
Int. Cl.³ G01N *25/72*
U.S. Cl. 374—5 **22 Claims**

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 62 Pages)



1. An ebulliometric hot spot detector for detecting hot spots on a powered electronic device, comprising:

container means for containing an ebulliometric liquid and a powered electronic device within a chamber, with said electronic device supported submerged in said ebulliometric liquid,

power means for applying power to said electronic device,

pressurizing means for establishing and varying pressure in the ebulliometric liquid in said chamber,

detector means for detecting the onset and termination of bubbling of said ebulliometric liquid in said chamber from the surface of said integrated circuit as said pressure is varied, including means for detecting the location of the sources of said bubbling, and

output means responsive to said pressure for generating and displaying a signal indicative of said pressure at the time of said termination of bubbling.

4,466,747

ASH LEVEL METER FOR A FIXED-BED COAL GASIFIER

George E. Fasching, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1982, Ser. No. 434,021
Int. Cl.³ G01F *23/72*
U.S. Cl. 374—101 **5 Claims**

1. In combination with a fixed-bed coal gasifier having a bed stirrer which travels vertically through at least an ash zone of the bed of said gasifier, an ash level meter, comprising:

temperature measuring means carried by said stirrer for measuring the temperature profile of said ash zone as said stirrer moves vertically through said ash zone and generating a temperature signal whose amplitude is proportional to the temperature along said ash zone;

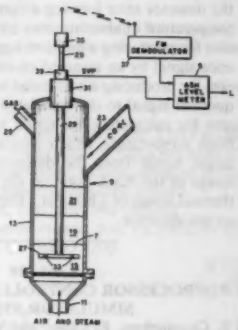
a comparator circuit means for comparing said temperature signal from said temperature measuring means with a preselected set point temperature signal and providing a first signal output state when said temperature signal amplitude is less than said set point temperature signal and a second signal output state when said temperature signal exceeds the amplitude of said set point temperature signal;

a clock signal generator for generating preselected frequency clock pulses;

a first counting means responsive to the state of the output signal from said comparator means for counting said clock pulses for a period when said comparator output is in said first state and generating an output signal X proportional to the counts registered by said first counting means;

a second counter means for counting said clock pulses for a period equal to the vertical travel period of said stirrer and generating a signal Y proportional to the counts registered by said second counter means;

means for detecting the stirrer vertical position and generating output pulses at a pulse repetition rate proportional to the vertical position of said stirrer;



a third counting means for counting said pulses from said stirrer vertical position detecting means and generating a signal Z proportional to the count registered by said third counting means; and

a processor circuit means responsive to said X, Y, and Z signals for generating an output signal L proportional to the ash level in accordance with the following equation:

$$L = K_1(X/Y)(Z/Y) + K_2,$$

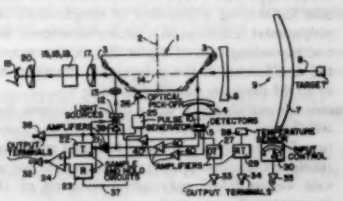
where K_1 and K_2 are calibration constants.

4,466,748

THERMAL IMAGING APPARATUS

Martin J. Needham, Charlwood, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,442
Claims priority, application United Kingdom, Jun. 5, 1981, 8117256
Int. Cl.³ G01J *5/52, 5/54*
U.S. Cl. 374—129 **14 Claims**



1. An apparatus for measuring the temperature of a target, said apparatus comprising:

a thermal radiation detector having a predetermined detectivity and spectral response, and capable of producing an output signal;

means for alternately forming a thermal image of the target

on the detector and a thermal image of a reference temperature source on the detector;

means for sampling the detector output signal when the target image is formed on the detector to produce a target signal, and for sampling the detector output signal when the reference source image is on the detector to produce a measured reference signal;

means for forming a difference signal which is equal to the difference between the target signal and the measured reference signal;

means for calculating a calculated reference signal which is equal to a signal which would be obtained from the detector by forming a thermal image of the reference source on the detector after forming a thermal image of a body at a temperature of absolute zero on the detector;

means for producing a quotient signal by dividing the difference signal by an assumed emissivity of the target;

means for producing a calculated target signal by adding the quotient signal to the calculated reference signal; and

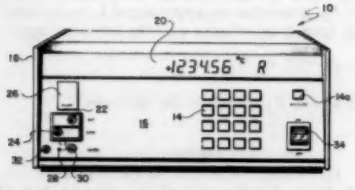
means for calculating the target temperature as that black body temperature which would produce the calculated target signal from the detector by forming a thermal image of the black body on the detector after forming a thermal image of a body at a temperature of absolute zero on the detector.

4,466,749

MICROPROCESSOR CONTROLLED THERMOCOUPLE SIMULATOR SYSTEM

Karl E. Cunningham, El Cajon, and Michael F. Wells, Poway, both of Calif., assignors to Ectron Corporation, San Diego, Calif.

Filed Apr. 15, 1982, Ser. No. 368,691
Int. Cl.³ G01K *7/14*; H03K *13/02*
U.S. Cl. 374—134 **11 Claims**



1. A thermocouple simulator system comprising:

a pair of output terminals;

means, including a computer processing unit, for inputting to the unit, selected data designating a selected thermocouple type, a sensing junction simulation temperature, a reference junction temperature for the selected thermocouple type and a type of output terminal metal;

means for storing a plurality of temperature versus EMF polynomial functions that each characterize an EMF of a corresponding one of a plurality of thermocouple types, the coefficients of the polynomial functions being stored in ROM memory detachable units;

means for calculating a value of EMF output for the inputted thermocouple type at the inputted simulation temperature for the inputted output terminal metal and inputted reference junction temperature using the stored temperature versus EMF polynomial function of the inputted thermocouple type; and

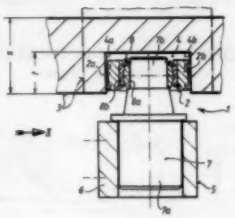
means for generating and applying to the output terminals a voltage representative of the calculated value of EMF, and for sensing the temperature of each of the output terminals and offsetting the voltage applied to the output terminals to compensate for the thermocouple junctions formed in connecting wires to the terminals.

4,466,750

BEARING SEGMENT FOR A SLIDING SHOE

Otto Heinemann, Ennigerloh; Burkhard Heiringhoff, Oelde; Helmut Lücke, Beckum; Werner Schössler, Ahlen, and Helmut Krumme, Wadersloh, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,441
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129066
Int. Cl.³ F16C *32/06*
U.S. Cl. 384—117 **8 Claims**



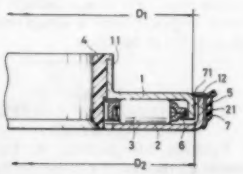
1. A bearing segment for a rotatable and tiltable anti-friction shoe comprising a fixed base; a stationary bearing pin supported by said base; and a radial ball and socket joint coupling said pin and said shoe, said joint having an inner bearing ring supported by said pin and an outer bearing ring carried by said inner bearing ring and supporting said shoe, said inner and outer rings having confronting arcuate surfaces enabling limited relative spherical movement therebetween.

4,466,751

COMBINED BEARING

Seiji Higuchi, Fujisawa, Japan, assignor to Nippin Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,516
Claims priority, application Japan, Dec. 25, 1981, 56-192791[U]
Int. Cl.³ F16C *21/00, 19/34*
U.S. Cl. 384—126 **8 Claims**



1. A combined bearing assembly comprising:

a thrust bearing adapted to receive a thrust load and including a number of rollers interposed between a planar inner member and a planar outer member;

a radial bearing consisiting of a radial receiving member adapted to recieve a radial load and secured to the inside diameter portion of a radial flange of said inner member;

the outer peripheral edge portion of said outer member having an outer flange formed by being axially bent; and

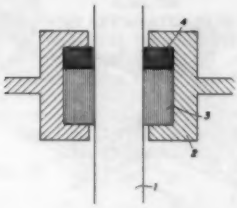
means inculding a restraining member of L-shaped cross section fitted to said outer flange and having a restraining portion extending radially towards said inner member with the inside diameter dimension of the restraining portion of said restraining member being smaller than the outside diameter dimension of said inner member so that said restraining portion engages said inner member for preventing said inner member and said outer member from being separated from each other under radial load.

4,466,752

CENTERING RING BEARING ELEMENT AND PROCESS FOR CENTERING OF A SHAFT

Jean-Jacques Falbierski, Jeumont, France, assignor to Jeumont-Schneider, Puteaux, France

PCT No. PCT/FR81/00020, § 371 Date Oct. 13, 1981, § 102(e) Date Oct. 13, 1981, PCT Pub. No. WO81/02451, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 18, 1981, Ser. No. 310,536
Claims priority, application France, Feb. 19, 1980, 80 03550
Int. Cl.³ F16C *23/00, 23/02, 33/02, 37/00*
U.S. Cl. 384—192 4 Claims



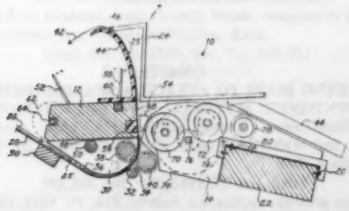
1. Apparatus for centering a shaft in a housing, said housing having a circumferential groove therein surrounding said shaft and having aperture means adjacent to said goove and through which said shaft extends, said apparatus comprising a bearing ring and a centering ring arranged in said groove in succession along the length of the shaft and surrounding the shaft independently of each other, the bearing ring having an inner diameter only slightly larger than the outer diameter of the shaft so that the shaft is normally supported in the housing by the bearing ring, and the centering ring having an inner diameter that is greater than the inner diameter of the bearing ring at normal operating temperatures so that the centering ring is normally spaced from the shaft and the shaft is not supported by the centering ring, the centering ring having a thermal coefficient of expansion which is greter than that of the shaft and greater than that of the bearing ring, the centering ring being free to contract radially onto the shaft repsonsive to a suitable temperature reduction, and thereby to center the shaft in the housing.

4,466,753

CARRIAGE GUIDING SYSTEM AND FRAME FOR A PRINTER

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Filed Sep. 24, 1982, Ser. No. 422,922
Int. Cl.³ B41J *19/00*
U.S. Cl. 400—354 16 Claims



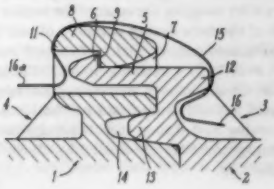
1. A printer comprising:
a stationary elongated platen,
a print carriage movable with reference to said platen and having printing means for producing printing along a writing line,
positioning means, comprising a motor having a rotary output shaft and connecting means driven by said shaft which converts the rotary motion to linear motion for positioning the carriage along the writing line,
a rigid elongated bar extending parallel to said platen; said print carriage and said positioning means being supported by, and substantially their entire weight being carried by, said bar,
a plurality of guideways disposed along said bar for guiding said carriage along a precise path parallel to said platen, said guideways being narrow with respect to the thickness of the bar,
said guideways including means cooperating with said print carriage to limit the print carriage to movement that is parallel to said writing line, and
reciprocal guiding means on said carriage for engaging said guideways and cooperating therewith to guide said carriage.

4,466,754

DEVICE FOR MUTUAL ASSEMBLY OF TWO PARTS HAVING TO BE OCCASIONALLY DISASSEMBLED

Gérard C. M. Poitier, Gennevilliers, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Jun. 11, 1982, Ser. No. 387,652
Claims priority, application France, Jun. 12, 1981, 81 11605
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—11 8 Claims



1. A device for mutual assembly of two parts which have to be occasionally disassembled, said two parts being produced from a synthetic material by moulding, wherein there is provided on the outer wall of each of said two parts at least one assembling group comprising a male portion on a first of said two parts and a female portion on a second of said two parts, the female portion defining a breakable upper member for freeing the male portion, said breakable upper member having a nose, the female portion further defining a recessed lower member, and the male portion having a nose and defining a recessed member, at least one resilient clip being provided to be provisionally engaged between the nose of said breakable upper member and the nose of the male portion; whereby after the breakable upper member of the female portion has been broken during a disassembly of the two parts, the resilient clip is engaged between the recessed member of the female portion and the recessed member of the male portion.

4,466,755

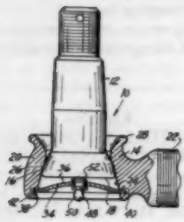
HEMISPHERICAL BALL AND SOCKET JOINT

Joseph E. Smith, Birmingham, Mich., assignor to O & S Manufacturing Company

Continuation-in-part of Ser. No. 061,644, Jul. 30, 1979, Pat. No. 4,347,014, and Ser. No. 263,778, May 14, 1980,. This application Aug. 13, 1981, Ser. No. 292,634
Int. Cl.³ F16C *11/06*
U.S. Cl. 403—36 6 Claims

1. A simple and relatively light ball joint structure consisting of three separate elements in assembly, the first of said elements being an integral stud and half-ball member, said half-ball being integrally formed at one end of said stud, said half-ball having a peripheral spherical surface and a flat end face, the second of

said elements being a socket member, said socket member having a bore open at both ends, a concave spherical surface disposed in the bore of said socket member proximate a first end thereof and normally engaged with the peripheral spherical surface of said half-ball such that said stud projects through said first end of said bore, and enlarged diameter portion in said bore proximate the other end of said bore, and a substantially annular flat surface between said concave spherical surface in said bore and said enlarged diameter portion of said bore, and the third of said elements being a resilient retainer cap, said retainer cap having a substantially convex surface engaged



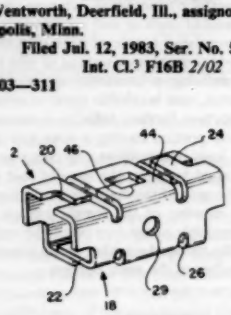
with the flat face of said half-ball, said resilient retainer cap being in the form of a disk dished towards said flat end face of said half-ball and having its edge engaged in a groove in said bore formed by swaging the edge of the socket member at said other end of the bore during assembly of said ball joint structure between said annular flat surface and said swaged-over edge such as to form a retaining lip for the edge of said dished disk while simultaneously displacing the edge of said disk towards said flat end face of said half-ball and elastically partially flattening said dished disk, whereby the spherical surfaces in engagement are pre-loaded by elastic deformation of said retainer cap.

4,466,756

DRIVE COUPLER

Milo R. Wentworth, Deerfield, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 12, 1983, Ser. No. 513,140
Int. Cl.³ F16B *2/02*
U.S. Cl. 403—311 **11 Claims**



1. A drive coupler comprising a first coupler half having a U-shaped configuration with a cutout at the end of each leg of the "U",

a second coupler half having a U-shaped configuration with a cutout at the end of each leg of the "U" and

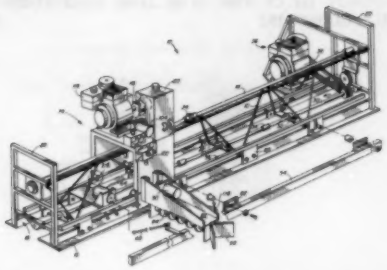
clamp means for retaining said first coupler half against said second coupler half with said ends of said legs of each "U" in an abutting relationship wherein said cutouts in said coupler halves form holes for capturing similarly configured peripheral grooves in the ends of shafts coupled by said drive coupler, wherein at least one of the holes formed by said cutouts is non-circular.

4,466,757

VIBRATORY SCREED INCLUDING A SPREADING DEVICE FOR LEVELING AND DISTRIBUTING PLASTIC CONCRETE IN FRONT OF THE SCREED

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Filed Jan. 13, 1983, Ser. No. 457,727
Int. Cl.³ E01C *19/30*
U.S. Cl. 404—114 **52 Claims**



1. A vibratory concrete screed for finishing the irregular surface of an area of plastic concrete lying between first and second spaced apart, generally parallel forms, the spacing between the first and second forms defining the width of the plastic concrete, said screed comprising:

a. a triangular truss frame having first and second ends and a length equal to or greater than the width of the plastic concrete;

b. a screed blade coupled to said frame;

c. means coupled to said frame for translating said frame along the length of the plastic concrete;

d. means for vibrating said screed blade;

e. concrete spreading means coupled to said screed frame for leveling the surface of and evenly distributing plastic concrete in front of said screed blade, including:

i. grading means for contacting the surface of the concrete;

ii. carriage means for maintaining said grading means at a predetermined elevation in front of said screed blade and for translating said grading means in either a first or a second direction along said screed frame;

whereby the grading means levels the irregular surface of the plastic concrete and moves excess concrete forward and away from said screed blade as said carrige means translates said grading means in first and second directions along the length of said screed frame.

4,466,758

HOLDING BODY TO ATTACH A SEALING FOIL OF SYNTHETIC MATERIAL TO A FOUNDATION

Ignaz Hinterreiter, Ramsauerstrasse 119, Linz, Austria A-4020, and Walter Neumüller, Argentinierstrasse 26, Vienna, Austria A-1040

Filed Jan. 27, 1982, Ser. No. 343,337
Claims priority, application Austria, Feb. 11, 1981, 638/81
Int. Cl.³ E21D *11/38, 11/40*
U.S. Cl. 405—150 **5 Claims**

1. A holding body for attaching a sealing foil of synthetic material to a foundation, which comprises two discs extending substantially parallel to each other and at least one bar substantially parallel to the discs and interposed therebetween, the two discs and the bar forming a one-piece body, one of the

discs having a base surface for contact with the foundation and the other disc having a top surface for connection to the sealing foil, and the bar having a tearing point of predetermined tearing strength.

4,466,759

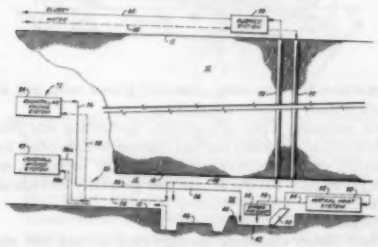
METHOD AND APPARATUS FOR SEQUENCE CONTROL OF VERTICAL MOVEMENTS OF SLURRIED PARTICULATES

William T. Sweeney, Ponca City, Okla.; Rick L. Shaw, and Frederick A. Webb, both of Bethel Park, Pa., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 22, 1982, Ser. No. 351,101

Int. Cl.³ B65G *53/66*

U.S. Cl. 406—15 **8 Claims**



1. A method for controlling flow start-up of a water and a particulate slurry from a lower level path upward through an elongated vertical conduit, comprising:

closing said path from said lower level to said elongated vertical conduit;

opening a path to a bypass;

pumping the water to a predetermined pressure head at said lower level; while,

dissipating said water out of said bypass until said pressure reaches said predetermined pressure head; then,

opening said path from said lower level to said vertical conduit; and,

simultaneously incrementally closing said path from said lower level to said bypass while maintaining steady flow up said vertical conduit.

4,466,760

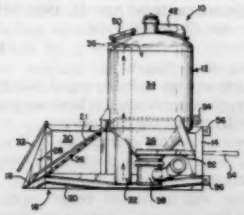
MOBILE MATERIAL HANDLER AND A METHOD FOR TRANSFERRING BULK MATERIAL

Robert J. C. Feldsted, King County, Wash., assignor to Premier Pneumatics, Inc., Shawnee Mission, Kans.

Filed Apr. 12, 1982, Ser. No. 367,371

Int. Cl.³ B65G *53/28*

U.S. Cl. 406—41 **2 Claims**



1. A mobile material handler to transfer dry, bulk, powdered material from a pile or the like to a truck load-out bin, a silo, or another receptacle, comprising:

(a) a frame having a generally open end to receive the material;

(b) a vacuum-pressure pneumatic conveyor mounted on the frame, and including an inlet means to receive the material in the open end of the frame and to convey the material to a storage vessel of the pneumatic conveyor and an outlet means exiting from the storage vessel;

(c) fluidizing means to aerate and to fluidize the material which is received in the open end of the frame and to cause that material to flow to the inlet means of the pneumatic conveyor;

(d) compressed air supply means to power the fluidizing means and the pneumatic conveyor; and

(e) a conduit connected to the outlet means of the pneumatic conveyor to allow transfer of the material from the storage vessel to the receptacle,

(f) the fluidizing means using the compressed air to aerate the material and including a porous mesh which allows compressed air to pass from the compressed air supply means upwardly through the material the porous mesh being a porous stainless steel aeration panel which is slanted downwardly away from the pneumatic conveyor to form a generally wedge-shaped nose cone away from the pneumatic conveyor and a fabric aeration means immediately behind the panel which is slanted downwardly toward the inlet means of the pneumatic conveyor.

4,466,761

PNEUMATIC-TUBE CONVEYING INSTALLATION FOR SAMPLES OF FINE MATERIAL

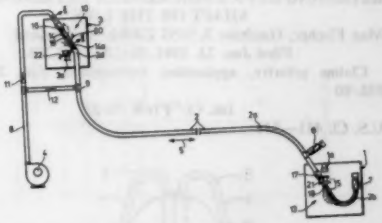
Herbert Beltrop, Hamm, and Josef Teutenberg, Beckum, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 303,855

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3038073

Int. Cl.³ B65G *51/26*

U.S. Cl. 406—74 **10 Claims**



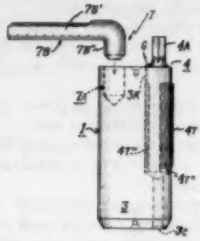
1. In a pneumatic-tube conveying installation for samples of fine materials, said installation having at least one sample despatch station for despatching a sample carrier, a sample receiving station for receiving the sample carrier, a delivery tube connecting the sample despatch station to the sample receiving station, and pneumatic means for moving a sample carrier through said tube between said stations, the improvement wherein said tube has a section thereof at least at one of said stations for accommodating said carrier, means mounting said one of said sections for tilting movements about an axis extending transversely of its longitudinal axis, and means mounted adjacent at least one of said stations and operable to extend into said delivery tube adjacent said section for removing and replacing a cap from and on said carrier, said means for removing and replacing a cap comprising a pneumatic seal arranged on the delivery tube and including a part displaceable relative to the tiltable tube section in the axial direction of the delivery tube and to which is fixed a cap remover having cap engaging elements displaceable transversely of the delivery tube.

4,466,762

TOOL FOR FORMING INTERNAL SCREW THREADS

Curtis M. Menke, Hendersonville, Tenn., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 12, 1981, Ser. No. 273,155
Int. Cl.³ B23G *3/00, 1/44, 7/00*; B27G *13/02*
U.S. Cl. 408—222 **15 Claims**



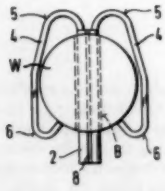
1. A tool for forming internal screw threads on the walls of a generally cylindrical bore in a member, comprising a metal cylinder having a diameter that slidably fits, with a predetermined clearance tolerance, within the bore in said member, and having an open-sided chamber for receiving therein a thread tap, a thread tap disposed in said chamber with one set of its teeth extending through the open side of said chamber and projecting radially outward a preset distance beyond the outer surface of said cylinder, means interconnecting said thread tap and said cylinder for securing said tap against rotation within said chamber and in locking relationship therewith, and driving means for rotating the cylinder about its longitudinal axis and within the bore in said member thereby causing the projecting teeth of said tap to form threads on the walls of said bore.

4,466,763

RETAINING DEVICE FOR AXIALLY RETAINING A PIN, SHAFT OR THE LIKE

Max Fischer, Hanfrose 3, 8055 Zürich, Switzerland

Filed Jan. 23, 1981, Ser. No. 227,776
Claims priority, application Switzerland, Jan. 24, 1980, 585/80
Int. Cl.³ F16B *19/02*
U.S. Cl. 411—521 **7 Claims**



1. A retaining device for axially retaining a pin, shaft or a first machine member in a second machine member, said retaining device comprising:

a central body which is adaptable to be radially inserted into a bore or recess of said first machine member;

lateral legs integral with said body intended for at least partial engagement with said first machine member;

said legs laterally curved in arcuate shape in a plane which is common to said central body;

said legs extending past said first machine member beyond a diametral line at right angles to said body;

end portions of said legs bending inwardly in hooked shape; and

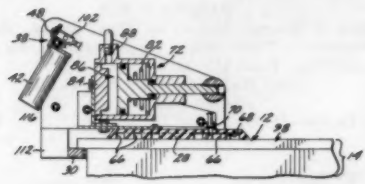
said body consisting of a tube with said legs extending from one end of the tube on opposite sides.

4,466,764

APPARATUS FOR SEPARATING AND LIFTING UNITS FROM A STACK

Charles G. Hutter, III, Carson City, Nev., assignor to Physical Systems, Inc., Carson City, Nev.

Filed Apr. 29, 1982, Ser. No. 373,001
Int. Cl.³ B65G *59/04*; B65H *5/14*
U.S. Cl. 414—121 **15 Claims**



1. Apparatus for separating generally planar units one at a time from a stack of units, comprising:

a frame including a pair of generally upstanding side plates connected in generally parallel relation to each other by a plurality of transversely extending brace members, said side plates each having at least one generally horizontally extending slot formed therein;

a carriage;

slide bolt means extending through each of said side plate slots and secured with respect to said carriage for slidably mounting said carriage for back and forth, generally horizontal displacement with respect to said frame generally within the limits of said slots;

a suction platen mounted on said carriage for movement therewith in a position for vacuum engagement with an upwardly presented surface of the uppermost unit in the stack;

a push block carried by said frame for bearing engagement with one peripheral edge of a unit in the stack underlying the uppermost unit;

means for coupling a source of vacuum to said suction platen; and

actuator means for displacing said carriage with respect to said frame in a direction generally parallel with the general plane of the uppermost unit in the stack such that the uppermost unit is displaced along with said carriage and separated from the stack.

4,466,765

MECHANIZED STORE

Sergio Mautino, Turin, Italy, assignor to Comau S.p.A., Grugliasco, Italy

Filed Apr. 5, 1982, Ser. No. 365,926
Claims priority, application Italy, Apr. 13, 1981, 67504 A/81
Int. Cl.³ B65G *1/04*
U.S. Cl. 414—277 **10 Claims**

1. In a mechanized store comprising:

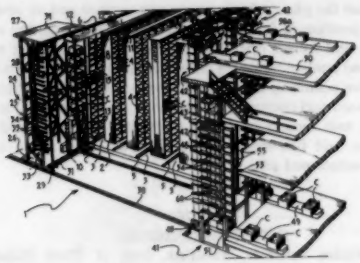
a plurality of article-storage cells arranged side by side in horizontal and vertical rows along at least one passage and open on their sides facing the said passage,

a transporter-elevator device comprising a first support structure movable horizontally along said passage, a second support structure movable vertically on the first support structure, and movement means carried by the second support structure and arranged to insert articles into, and remove articles from said storage cells, and

an article-transfer station capable of being accessed by the said transporter-elevator device to allow the loading onto the latter of each article to be inserted in a corresponding said storage cell, and the removal from said transporter-elevator device of each article to be conveyed to the exit of the store; the improvement comprising

said transporter-elevator device having a series of auxiliary compartments carried by said first support structure, for the simultaneous transport of a plurality of articles,

transfer means for simultaneously transferring a plurality of articles from said auxiliary compartments of the transporter-elevator device to said transfer station and vice versa,



said movement means of the transporter-elevator device being arranged to transfer articles from the said auxiliary compartments to the said storage cells and vice versa, said first support structure of the transporter-elevator device carrying a first series and a second series of auxiliary compartments, and said transfer means being arranged to simultaneously transfer a first series of articles from said first series of auxiliary compartments to the transfer station, and a second series of articles from the transfer station to the said second series of auxiliary compartments.

4,466,766

TRANSFER APPARATUS

Lorenzo D. Geren, deceased, late of Houston, Tex. (by Henrietta C. Geren, administratrix), and Raymond D. Worden, Houston, Tex., assignors to Ruska Instrument Corporation, Houston, Tex.

Continuation of Ser. No. 265,633, May 20, 1981, abandoned. This application May 24, 1983, Ser. No. 497,544

Int. Cl.³ B65B *5/08*

U.S. Cl. 414—404 **11 Claims**

1. A transfer device for transferring a plurality of wafers between carriers comprising:

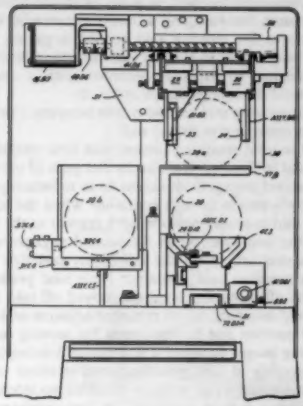
a support for a first carrier,

a support for a second carrier positioning the planes of the wafer grooves in the two carriers parallel to each other and on the same plane,

a wafer support system having opposed wafer support means including alternate lands and grooves therein with said grooves being alternately provided with and without lower portions of reduced depth such that the alternate grooves having such lower portions engage and support wafers at their periphery below the horizontal centerline of the wafers while the side walls of the grooves above the lower portions maintain the wafer substantially vertical,

means for moving said lower portions of reduced depth toward each other to support wafers therebetween and away from each other to release said wafers, and

means for moving said wafer support system and carriers vertically and transversely relative to each other to transfer wafers on said wafer supports between carriers,



said alternate grooves without said lower portions sized to pass over wafers in any position of the wafer support means.

4,466,767

AUTOMATIC APPARATUS FOR THE POSITIONING AND REMOVAL OF THE CASING OF PAPER BOARD BOXES

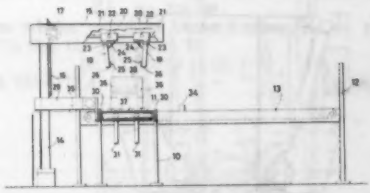
Luciano Meschi, Leghorn, Italy, assignor to Wully S.A., Panama

Filed Mar. 9, 1982, Ser. No. 356,339

Claims priority, application Italy, Mar. 10, 1981, 20237 A/81

Int. Cl.³ B65G *65/34*

U.S. Cl. 414—411 **12 Claims**



1. Automatic apparatus for the positioning and removal of the casing of paper board boxes comprising a cover and container telescopically coupled, said container having a bottom panel and side panels separated from each other at the vertical corners and maintained in the vertical position by said cover, comprising:

means for moving said boxes on said bottom panel along a sliding plane in a predetermined horizontal direction to a case removal station at a predetermined position;

revealing means to signal the presence of a box at said predetermined position;

a single first means for engaging and then removing both said cover and said container respectively, in separated steps;

means for moving said first means between a rest position and an operating position in which the component to be removed is engaged by means of respective grasping means mounted on said first means and for moving said grasping means holding said cover and container, respec-

tively, away from said predetermined position, said removal of said cover from said container allowing the separate side panels to move down to a coplanar position with respect to the bottom panel of the container;

second means for engaging an article contained in the box and means for moving said second engaging means to cause said article to slide in said predetermined direction with respect to the said container until a condition of reciprocal disengagement is attained;

means for moving said second means between a rest position and an operating position; and

first and second retaining means, said first retaining means mounted in fixed position under the path of movement of said second engagement means so as to intercept the sliding displacement of said container when the side panels are in said coplanar position with respect to the bottom of the same container when the second engagement means moves said article off the container, said first engaging means removes said container from said predetermined position after the articles are removed off said container;

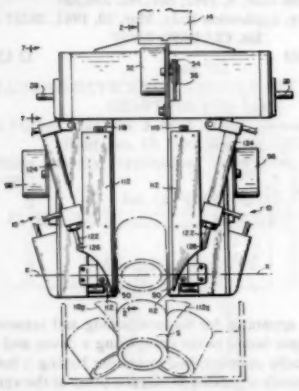
said second retaining means mounted adjacent said predetermined position and having means for moving said second retaining means between a position of interception of the box arriving at said predetermined position to stop its movement and a rest position in which no interception of the relative motion between the form package and the container takes place.

4,466,768

APPARATUS FOR MANIPULATING A WORKPIECE OR THE LIKE

Philip S. Datseris; Ali C. Sayder, and William J. Palm, all of Kingston, R.I., assignors to The Board of Regents for Education for the State of Rhode Island, Providence, R.I.

Filed Mar. 19, 1982, Ser. No. 359,885
Int. Cl.³ B65G *47/14*; B25J *15/00*
U.S. Cl. 414—729 **9 Claims**



1. Apparatus for manipulating an element such as for example a workpiece being subjected to a manufacturing process, said apparatus comprising:

a first contact member including a pair of finger assemblies having contact members arranged in a confronting relationship,

first operating means for moving said finger assemblies along an axis towards each other to grip an element between said contact members and away from each other to release the element;

second operating means for rotating said contact members about said axis in order to impart a corresponding rotation to an element gripped therebetween;

third operating means for moving said contact members relative to one another in either the same or opposite parallel directions transverse to said axis, whereupon movement of said contact members in the same direction will impart translational movement to an element gripped therebetween in a direction transverse to said axis, and movement of said contact members in opposite directions will impart rotational movement to an element gripped therebetween about a second axis transverse to said first mentioned axis; and

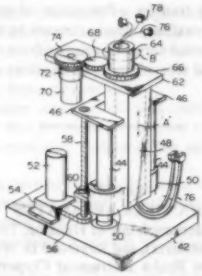
a second contact member arranged adjacent to the first-mentioned contact members of each finger assembly, each second contact member being movable relative to the element contacting surfaces of its respective first-mentioned contact member between an inoperative position behind the plane of said contacting surface and an operative position in front of the plane of said contacting surface, and fourth operating means for reciprocating said second contact members between said operative and inoperative positions, whereupon where an element is gripped between said operatively positioned second contact members, said second operating means may be employed to rotate said first-mentioned contact members about said first-mentioned axis.

4,466,769

INDUSTRIAL ROBOT

Hajimu Inaba; Seiichiro Nakajima, both of Hino; Shigemi Inagaki, Musashino, and Susumu Ito, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,882
Claims priority, application Japan, Jun. 29, 1981, 56-099740
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—744 R **4 Claims**



1. An industrial robot having a stationary robot base, a vertical motion unit mounted on said robot base, a rotary motion unit mounted on said vertical motion unit, and a robot hand attached to a horizontal robot arm by means of a robot wrist forming part of said rotary motion unit, and having a hollow structure defining a vertical cavity formed as a wiring and piping space comprising:

vertical guides and a vertical feed mechanism mounted on said stationary robot base;

a hollow frame member forming the body of said vertical motion unit and extending vertically from immediately above said stationary robot base, said hollow frame member having formed externally thereon slides fitted on said vertical guides and a projecting interlocking member engaged with said vertical feed mechanism for imparting vertical motion; and

an upper support plate fixed to the upper end of said hollow frame member and having rotatably mounted thereon a tubular member supporting thereon said rotary motion unit, said tubular member being disposed so as to be substantially in alignment with said hollow frame member, whereby said hollow frame member and said tubular

member form a hollow vertical structure extending from said stationary robot base up into said rotary motion unit.

4,466,770

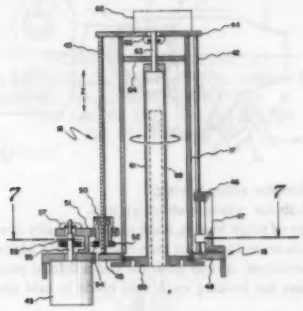
ROBOTIC MACHINE

Donald C. Peroutky, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 294,588, Aug. 20, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,784

Int. Cl.³ B65G 7/00

U.S. Cl. 414—751 2 Claims



1. A modular robotic assembly machine having three mutually perpendicular axes and a rotational movement about the third axis comprising:

a first carriage supported on a frame, a second carriage supported on said first carriage, a third carriage supported on said second carriage, and drive means for moving said carriages linearly along the respective mutually perpendicular axes;

said third carriage including an elongated tubular housing having end plates between which a non-rotating lead screw is fastened, a plurality of way rods on one of said second and third carriages and, on the other, linear bearings on which said way rods ride, said lead screw and way rods and bearings being exterior to said elongated housing;

a rotation plate that is mounted on one end plate and has a central hole, and rotation drive means comprising a drive motor supported on the other end plate which is connected through an axial hollow shaft to said rotation plate;

gripper means for performing automatic assembly tasks attached to said rotation plate, the space between said elongated housing and hollow shaft, and the inside of said hollow shaft, serving as a conduit for electrical leads and pneumatic tubes and to receive a power cylinder on said gripper means; and

a stand which supports said frame and has a horizontal assembly table.

4,466,771

WHEELCHAIR LIFT

Graham R. Thorley, and Donald B. Sullivan, both of 9345 Cabot Dr., San Diego, Calif. 92126

Filed May 29, 1981, Ser. No. 268,466

Int. Cl.³ B60D 1/46; B60R 3/02

U.S. Cl. 414—787 3 Claims

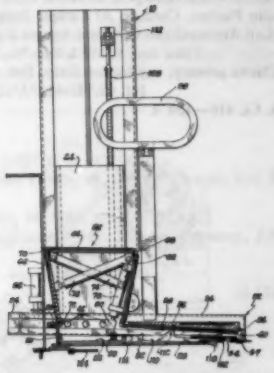
1. Means of operating a series of articulated panels between a step mode and a platform mode comprising:

(a) a step comprising a back panel, a step panel, and a riser panel sequentially hinged together;

(b) means limiting the lower edge of said back panel to articulate motion about a substantially horizontal axis;

(c) means limiting the translatory motion of the lower edge of said riser panel to substantially horizontal translation generally perpendicular to said horizontal axis; and

(d) a pair of actuators each capable of forceable extension and retraction and each articulated, respectively, to said back panel and step panel, and to said step panel and riser



panel, whereby upon extension of said actuators said back, step, and riser panels are forceably opened, forcing the lower edge of said riser to translate away from said horizontal axis, and said panels to form into a flattened platform, and upon retraction of said actuators said panels form into said step mode.

4,466,772

CIRCUMFERENTIALLY GROOVED SHROUD LINER

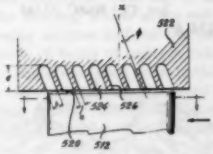
Ülo Okapuu, 309 Place Valencay, St. Lambert, Quebec, Canada J4S 1S3, and Kiritkumar V. Patel, 4176 Trellis Crescent, Mississauga, Ontario, Canada L5L 2M2

Continuation-in-part of Ser. No. 968,429, Dec. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 924,371, Jul. 13, 1978, abandoned. This application Jan. 27, 1981, Ser. No. 228,889

Claims priority, application United Kingdom, Jul. 14, 1977, 29653/77; Oct. 12, 1978, 40287/78

Int. Cl.³ F01D 11/08, 5/20

U.S. Cl. 415—172 A 11 Claims



1. A gas turbine engine having a rotor provided with a plurality of radially extending blades and a stationary shroud surrounding the rotor, each blade having a high pressure side and a low pressure side relative to the fluid flow and a substantially smooth tip end surface, the stationary shroud comprising in its radially inward facing surface, a plurality of spaced-apart lands providing parallel grooves in the surface formed so as to reduce leakage of working fluid from the high pressure side to the lower pressure side of the rotor, said parallel grooves being inclined relative to a radial plane towards the fluid flow at an angle between 10° and 40°, the thickness of each land, the spacing between the lands and the depth of the groove being selected as a function of the flow characteristics of the turbine,

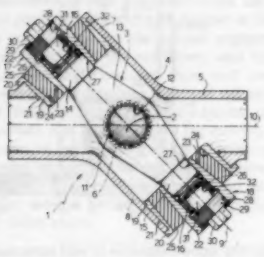
and wherein t/d>1 where t is the width dimension of the widest part of the blade and d is the depth of the grooves.

4,466,773

COUNTERTORQUE ROTOR FOR HELICOPTERS

Emilio Pariani, Cardano Al Campo, Italy, assignor to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed Jan. 6, 1982, Ser. No. 337,441
Claims priority, application Italy, Feb. 5, 1981, 67154 A/81
Int. Cl.³ B64C *11/12*
U.S. Cl. 416—134 A 3 Claims



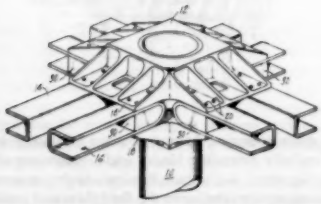
1. A countertorque rotor for helicopters comprising a tubular hub (4), a transmission shaft (3) extending through the hub (4) and coplanar therewith, a drive shaft (2) extending radially through said hub (4) and angularly connected to said transmission shaft, and two couplings (17, 18) each connecting a respective end of said transmission shaft (3) to a respective portion of said hub (4), each said coupling (17, 18) comprising an inner bush (22) slidably coupled to said transmission shaft (3), and adjustable actuator means (29) interposed between the said shaft (3) and each said bush (22) for axially displacing this latter along said shaft (3).

4,466,774

COMPOSITE FLEXBEAM JOINT

James P. Cycon, Milford; Timothy A. Krauss, Horwinton, and Stephan Roman, Shelton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 30, 1982, Ser. No. 413,029
Int. Cl.³ B64C *27/48*
U.S. Cl. 416—134 A 11 Claims



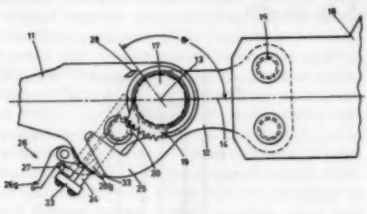
1. A helicopter rotor having a flexbeam attaching each rotor blade to the rotor hub, in which the flexbeam is generally of C-section and has a web and top and bottom flanges, the top and bottom flanges at at least one end of the flexbeam being connected by an arc section, a fitting at that end encased within the web, top and bottom flanges and arc section, and at least one attachment hole extending through said flanges and said fitting.

4,466,775

HELICOPTER ROTORS

Alfred C. Martin, Shepton Mallet, England, assignor to Westland plc, Yeovil, England

Filed Nov. 9, 1982, Ser. No. 440,285
Claims priority, application United Kingdom, Nov. 19, 1981, 8134956
Int. Cl.³ B64C *11/28*
U.S. Cl. 416—143 19 Claims



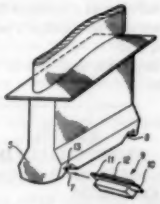
1. A helicopter rotor having:
a rotor hub for rotation about an axis;
a plurality of rotor blades, each blade pivotally connected to said hub so as to permit movement of said blade between an operational spread position and a folded position;
lock means for locking each said blade in said spread position;
a reversible rotary power means for moving each said blade between said spread position and said folded position; and
a rack and pinion mechanism that includes a rack and a pinion, one of which is driven by said power means and the other of which is operationally connected to said lock means such that said power means operates said rack and pinion mechanism for releasing said lock means prior to said power means moving said blade to said folded position thereof, and for re-engaging said lock means when said blade has been moved to said spread position by said power means.

4,466,776

AXIAL LOCKING DEVICE FOR TURBOMACHINE BLADES

André A. M. L. Camboulives, Savigny Sur Orge, France, assignor to S.N.F.C.M.A., Paris, France

Filed Jan. 14, 1983, Ser. No. 457,941
Claims priority, application France, Jan. 14, 1982, 8200496
Int. Cl.³ F01D *5/32*
U.S. Cl. 416—221 12 Claims



1. An axial locking arrangement for turbomachine blades having shanks mounted in axial first slots of a rotor disk, said first slots including means for radially locking said blades, said axial locking arrangement comprising:
at least one conical bearing surface formed on an axial rim of said rotor disk, the maximum radial position of said bearing surface being at least equal to a radius of a circumferential line passing through the bottom of said first slots;

a second slot in a lower surface of at least one end of each said shank, the length of each said second slot extending parallel to the plane of said disk when said shanks are mounted in said first slots;

locking means individually inserted in each said slot, each said locking means being formed of a piece shaped to be inserted in said second slot in a direction having a radial component and to bear against one said bearing surface and walls of said second slot when inserted in said second slot and when said shank is in said first slot; and

means separate from said locking means for circumferentially fixing said locking means within said second slot.

4,466,777

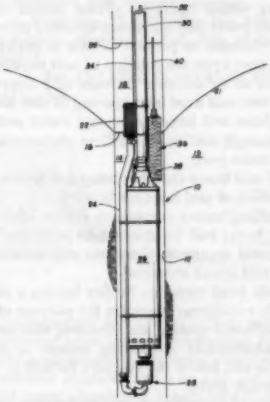
PUMP CONTROL CIRCUIT

Denver K. Kimberlin, Pauls Valley, Okla., assignor to Engineering Enterprises, Inc., Oklahoma City, Okla.

Filed Jun. 18, 1982, Ser. No. 389,594

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—12 **5 Claims**



1. A digital control circuit for a pump of the type used to pump a column of hydrocardons floating on a column of water, such a pump having means for generating a first signal when the pump intake is received within nonconducting fluid, means for generating a second signal when the pump intake is a predetermined distance above a nonconducting fluid, and a float switch adapted to switch when the pump intake is received within liquid, said circuit comprising:

a first AND gate operatively connected to said signal generating means for generating a high signal level on an output terminal when both the first and second signals are present;

a second AND gate operatively connected to said signal generating means for generating a high signal level on an output terminal when neither of the first and second signals are present;

a third AND gate operatively connected to said first AND gate and to said float switch for generating a high signal level on an output terminal when said first AND gate output is high and said pump intake is received within liquid;

a fourth AND gate operatively connected to said second AND gate and to said float switch for generating a high signal level on an output terminal when said second AND gate output is high and when said pump intake is received within liquid;

a timer operatively connected to said third AND gate, said timer generating a high level on an output terminal a preselected time after the output terminal of said third AND gate changes to a high level, said timer maintaining said high output for so long as said third AND gate output remains high;

a pump motor power supply;

switch means operatively connected to said timer, to said power supply, and to the pump motor, said switch means applying power to the pump motor for so long as the timer output remains high; and

latch means operatively connected to said fourth AND gate and to said switch means for maintaining application of power to the pump motor until the fourth AND gate output changes to a high level.

4,466,778

EJECTOR DEVICE

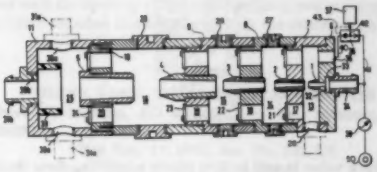
Jürgen Volkmann, Zum Vulting 10, D-4777 Schwefe, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,375

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025525

Int. Cl.³ F04F *5/00*

U.S. Cl. 417—174 **12 Claims**



1. An ejector device having at least three ejectors formed by a corresponding number of axially aligned, successive nozzles of increasing cross-section in the direction of flow, said device comprising:

an outer, elongated housing,

a plurality of spaced apart transverse walls extending across the housing to sub-divide it into at least three chambers, each transverse wall containing at least one of said nozzles, a one way valve in each transverse wall other than the first transverse wall permitting fluid flow only in the same direction of flow as through the nozzles, at least one of said chambers including a connecting opening passing radially through said housing,

said device being formed of modules, each module containing one of said transverse walls and an axially extending section of the housing which abuts and connects with adjacent housing sections to form the said housing, said housing sections all being of uniform exterior circumferential size and shape with each other to be interchangable, such that the ejector device is constructed by the assembly of any number of said interchangable modules having selected axial lengths and nozzle constructions.

4,466,779

CHECK VALVE WITH INJECTOR

Jeddy D. Nixon, 1706 S. Gessner Rd., Houston, Tex. 77063

Filed Sep. 30, 1982. Ser. No. 430,975

Int. Cl.³ F04B *9/02*

U.S. Cl. 417—229 **16 Claims**

1. A check valve and injector for well head flow lines comprising

a hollow valve body having an inlet opening and an outlet opening,

a valve seat member in said valve body,

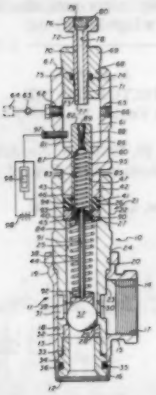
a hollow body defining a pump chamber supported on said valve body and opening into the outlet side thereof and having an inlet operable to be connected to a source of injection fluid,

a hollow piston sealed against leakage in and moveable

longitudinally of the opening between said valve body and said pump chamber and having an opening into said valve body,

a spring loaded ball valve in said valve body cooperable with said valve seat member,

means interconnecting said ball valve and said piston for conjoint movement and including lost motion means permitting overtravel of said ball valve relative to said piston,



a check valve in said hollow piston permitting flow through said piston in the direction of said valve body, and

opening movement of said ball valve being operable to move said piston to pump fluid from said pumping chamber into the outlet side of said valve body to mix with fluid flowing therethrough.

4,466,780

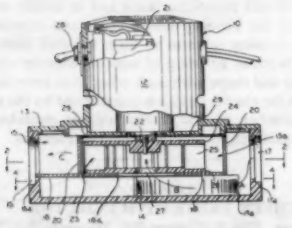
PORTABLE AIR PUMP APPARATUS

Rolf H. Naurath, Naples, Fla., assignor to Elco International, Ltd., Naples, Fla.

Filed Jan. 28, 1981, Ser. No. 229,153

Int. Cl.³ F04B *35/04;* F04D *29/42*

U.S. Cl. 417—360 **3 Claims**



1. A portable air pump apparatus comprising:

a hollow housing member including a substantially cylindrical impeller housing and a substantially cylindrical motor housing in operable alignment therewith;

each of said impeller and motor housings being operably attached in said alignment to one another along a bottom portion of said motor housing,

said bottom portion of said motor housing further sealably separating said motor housing from said operably aligned impeller housing;

motorized drive means mounted in said motor housing having a vertical drive shaft extending from a first shaft end downwardly through said motor housing bottom portion towards and into said impeller housing;

an impeller operatively connected proximate to a second end of said vertical drive shaft within said impeller housing,

said first shaft end substantially opposite said second shaft end,

said impeller having an axial inlet opening described along a bottom side thereof and,

said axial inlet further including a plurality of vanes radiating outwardly to a position proximate to the periphery of said impeller;

said impeller housing including both an upper and a lower chamber,

said impeller housing further including exhaust port means in said upper chamber and intake port means in said lower chamber respectively,

said upper and lower chambers within said impeller housing being separated by a substantially horizontal separator plate having an aperture formed therethrough to permit the flow of air from said lower chamber through and into said upper chamber;

upper baffling means operably affixed within said upper chamber and lower baffling means operably affixed within said lower chamber to prompt air that is drawn through said intake port upon the rotation of said impeller by said drive means to be directed through said lower baffling means and into said axial inlet opening of said impeller for discharge from said impeller by said vanes and, in turn, directed through said upper baffling means towards and out said exhaust port;

the bottom of said lower chamber being defined by a bottom surface portion of said impeller housing;

said lower baffling means comprising one or more curvilinear upright lower bulk head members positioned between said horizontal separator plate and said bottom surface portion of said lower chamber;

said lower bulk head members further having a continuous substantially curvilinear shape for the purpose of continuously and efficient routing and directing said air into one or more substantially circulating masses at a position proximate to and below the aperture formed in said horizontal separator plate;

said rotation of said impeller, in either direction, creating a vacuum so as to draw air from the lower chamber, through said aperture in said horizontal separator plate and into said upper chamber as a function of suction created at the axial inlet of said impeller;

said upper baffling means serving to direct said routed and directed air emanating from said impeller vanes towards and out said exhaust port;

said air being routed and directed continuously and efficiently towards and out said exhaust port and being precluded from entry into said lower chamber by said substantially horizontal separator plate which seals the inadvertent and undesirable flow of air between said chambers to any point other than unidirectionally through said aperture formed therethrough;

said upper and lower chambers cooperating with said horizontal separator plate, the aperture formed therethrough, said upper and lower baffling means, said intake and exhaust port and said axial inlet opening of said rotating impeller together with its vanes, to describe a circulatable air passageway into and through said lower chamber towards, into and out from said upper chamber, upon the rotation of said impeller, regardless of the direction of such rotation; said upper baffling means including a plurality of upper bulkhead members having a top edge and a bottom edge,

said bottom edge of said upper bulkhead members being affixed to said horizontal separator plate,

said top edge of said upper bulkhead member sealably contacting said horizontal bottom surface of said upper motor housing to form said upper chamber containing said impeller;

said upper bulkhead member substantially surrounding said impeller to provide a passageway for air flow leading to said exhaust port from said impeller,

said axial inlet opening on said impeller being positioned proximately above said aperture in said horizontal plate,

said impeller vanes being interposed between said bottom surface portion of said motor housing and said horizontal separator plate; and

said intake port and said exhaust port being substantially diametrically opposed in position within said apparatus to permit the entry and exit of circulated air into and out of said air pump apparatus in directions substantially normal to said vertical drive shaft.

4,466,781

ARRANGEMENT FOR FEEDING FUEL, PARTICULARLY FROM SUPPLY CONTAINER TO INTERNAL COMBUSTION ENGINE OF A POWER VEHICLE

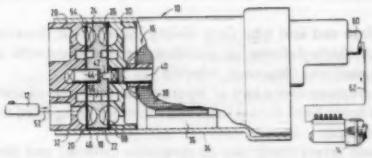
Ulrich Kemmner, Stuttgart, and Peter Ringwald, Rutesheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,981

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223515

Int. Cl.³ F04B *35/04;* F04D *5/00*

U.S. Cl. 417—366 **8 Claims**



1. An arrangement for feeding a fuel, particularly from a supply container to an internal combustion engine of a power vehicle, the arrangement comprising a feeding pump having a feeding member rotatable about an axis and means forming a cylindrical pump chamber in which said feeding member rotates, said pump chamber having an inlet and an outlet, said means including two chamber walls formed as separate members of a material deformable under pressure and extending transverse to said axis, and a tubular housing part retaining said chamber walls in a desired position, said means also including a further chamber wall surrounding said axis and formed by said tubular housing part, said tubular housing part having at least two inwardly deflectable tongues arranged, so that after said two members have been aligned within said tubular housing part said tongues are deflected radially inwardly and deform said members so as to hold the latter in such a position as to guarantee that the distance between said two chamber walls is sufficient for said feeding member to be arranged with axial play in said pump chamber.

4,466,782

VALVE UNIT FOR USE IN CONCRETE PUMPS

Shigeaki Hirashima, Iwatsuki, and Shintaro Chida, Gunma, both of Japan, assignors to Niigata Engineering Co., Ltd., Japan

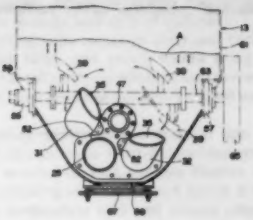
Filed May 25, 1982, Ser. No. 381,707

Claims priority, application Japan, Jun. 10, 1981, 56-85315[U]; Sep. 21, 1981, 56-140210[U]; Sep. 21, 1981, 56-140212[U]

Int. Cl.³ F04B *7/00*

U.S. Cl. 417—517 **13 Claims**

1. A fluid passage change over valve unit for concrete pumps of the type wherein a passage change over valve member located within a hopper is connected at its outlet port to a delivery line for pivoting about the latter so that an inlet port thereof is swung to alternately communicate with a pair of piston pumps with pump openings into the hopper, the improvement which comprises a pair of guide members disposed along both sides of the passage change over valve member, one end of each said guide member opening upwards and the other end being disposed to come into alignment with the opening of



corresponding one of the piston pumps for guiding concrete within the hopper to said one pump when the change-over valve member communicates with the other piston pump and means for positioning each of said guide members into alignment with the opening of the corresponding piston pump when the valve member communicates with the other piston pump.

4,466,783

THREE VANE, TWO LOBE FLUID MOTOR

Robert W. Norman, 373 Bellefontaine Rd., Houston, Miss. 38851

Filed Dec. 17, 1981, Ser. No. 332,301

Int. Cl.³ F01C *1/00, 21/12*

U.S. Cl. 418—15 **9 Claims**

1. A rotary motor including a hollow housing having opposite ends and defining a cavity within said housing including two slightly greater than one-half cylindrical portions opening toward and into each other and defining a pair of opposite lobes projecting inwardly of opposite sides of the cavity, the opposite ends of said housing being closed by spaced apart end walls between which said cavity is defined, a cylindrical rotor journaled in said cavity for rotation about an axis at least substantially lying upon a straight line extending between the lobes and with said axis spaced from said lobes distances substantially equaling the radius of said rotor, said rotor defining a cylindrical disk-shaped body having at least one central cavity therein spaced inward of the outer periphery of said rotor, three substantially equally angularly spaced apart and generally radial slots formed in said rotor extending axially therethrough and opening radially inwardly into said rotor cavity, three vanes slidably received in said slots and having inner ends projecting into said rotor cavity, a cylindrical radial thrust transmitting ring loosely disposed in said rotor cavity for shifting therein in all directions in a plane disposed normal

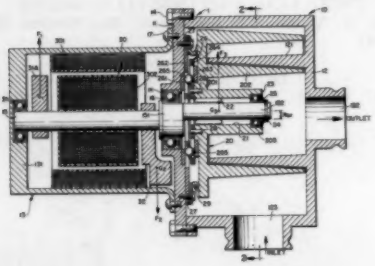
to said axis, the inner end of each vane being disposed for engagement with the adjacent periphery portion of said ring for inwardly shifting that peripheral portion toward said axis responsive to inward radial shifting of the last-mentioned vane, and fluid inlet and exhaust means opening into and out of each of said one-half cylindrical cavity portions outward of said rotor.

4,466,784

DRIVE MECHANISM FOR A SCROLL TYPE FLUID DISPLACEMENT APPARATUS

Masaharu Hiraga, Honjo, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 3, 1982, Ser. No. 354,512
Claims priority, application Japan, Mar. 3, 1981, 56-29433
Int. Cl.³ F01C *1/02, 17/06, 19/12, 21/02*
U.S. Cl. 418—55 **17 Claims**



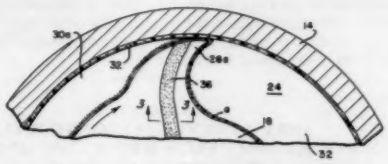
1. A scroll type fluid displacement apparatus comprising:
a housing having a fluid inlet port and fluid outlet port;
a fixed scroll joined with said housing and having a first end plate from which a first wrap extends into an operative interior area of said housing;
an orbiting scroll having second end plate from which a second wrap extends, and a tubular member axially projecting from a generally central radial area of said second end plate into said operative interior area to at least adjacent the axial center of said first wrap, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of fluid pockets;
rotation preventing means disposed in said housing for preventing the rotation of said orbiting scroll;
a driving mechanism including a drive shaft rotatably supported by said housing to drive said orbiting scroll in an orbital motion to thereby change the volume of said fluid pockets;
a crank pin axially projecting from an inner end of said drive shaft at a location radially offset from the center of said drive shaft, and said crank pin being rotatably carried in a hollow interior of said tubular member through a bearing assembly, at least a portion of said bearing assembly being carried in a recess in said hollow interior; and
a snap ring attached to a distal end of said crank pin, and a spring washer placed between and in contact with said snap ring and said at least a portion of said bearing assembly.

4,466,785

CLEARANCE-CONTROLLING MEANS COMPRISING ABRADABLE LAYER AND ABRASIVE LAYER

Chandi P. Biswas, Rocky Hill, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 18, 1982, Ser. No. 442,603
Int. Cl.³ F04C *18/20, 27/00;* **F16J** *15/16*
U.S. Cl. 418—152 **13 Claims**



1. Clearance-controlling means, in a machine having a rotary element, comprising:
a machine having a housing;
said housing having a chamber formed therein;
said chamber having a circumferential surface bounded by a pair of spaced-apart end walls;
a given rotor mounted for rotation within said chamber;
said rotor having a radial lobe for sweeping about said circumferential surface in close proximity to said surface; and
said surface and said lobe each having means fixed thereon cooperatively defining an interface therebetween with a single, uniform clearance; wherein
said means comprises a pair of layers of material, one of said layers being fixed to said lobe, and the other being fixed to said surface;
one of said layers comprises an abradable material, and the other of said layers comprises an abrasive material;
said abrasive material comprises particles;
said particles have a generally common diameter, each thereof buttressing, and being buttressed by, the others thereof; and
substantially all of said particles cooperate to define a substantially uniform abrasive surface.

4,466,786

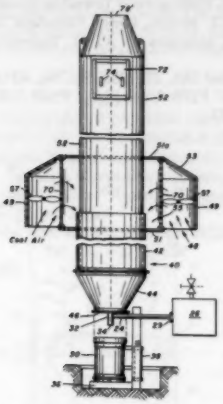
APPARATUS FOR PRODUCTION OF ATOMIZED POWDER

A. David Booz, New Kensington; Kalman E. Buchovecky, Oakmont; Walter S. Cebulak, New Kensington, all of Pa.; Ray A. Kuchera, and David D. White, Jr., both of Rockdale, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,511
Int. Cl.³ B01J *2/04*
U.S. Cl. 425—7 **9 Claims**

1. An improved apparatus for the production of particulate metal comprising:
(a) a containment vessel having a sidewall extending to a bottom plate;
(b) a source of molten metal external to said vessel;
(c) nozzle means capable of converting said molten metal into metal particles carried by said bottom plate, said nozzle means including a central bore and providing communication between said vessel and said external source of molten metal, the sidewall and bottom plate cooperating with the nozzle means to seal off the interior of said vessel and the metal particles therein from the area external to said vessel adjacent said source of molten metal;

(d) a source of atomizing gas flowing through said nozzle means into said vessel; and



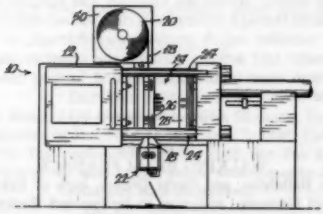
(e) means for purging said central bore to remove depositions of metal and metal compounds therefrom utilizing said atomizing gas.

4,466,787

APPARATUS FOR FORMING SUPPORT DEVICE

Meyer J. Ragir, 180 E. Pearson, Chicago, Ill. 60611, and John M. Bielecki, Chicago, Ill., assignors to Meyer J. Ragir, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,863
Int. Cl.³ B29F *1/10*
U.S. Cl. 425—122 **8 Claims**



1. An apparatus for making a molded plastic article having a wooden backing member bonded thereto, comprising:

an injection molding machine having a molding die assembly including a male mold portion and a female mold portion, and means for relatively moving said male and female mold portions into registry with each other to provide a mold cavity therebetween;

a punch and die mechanism associated with one of said mold portions, said mechanism including cooperative punch means and cutting edge means aligned with said mold cavity, said cutting edge means being fixed to said one mold portion;

means for supplying a continuous strip of wooden backing material;

means for supporting and aligning said continuous strip of material between said punch means and said cutting edge means in juxtaposition to said cutting edge means;

means for intermittently drawing said strip of material between said punch means and cutting edge means in synchronization with operation of said moving means comprising a pair of rollers supported by a frame between which said strip of material is drawn, and intermittently operable means for cutting said continuous strip of material after movement thereof between said rollers;

said drawing means being mounted for movement with said one mold portion to maintain said continuous strip of material in juxtaposition to said cutting edge means;

said moving means including means for advancing said punch means through said strip of material in cooperation with said cutting edge means to sever said backing member from said strip, said punch means being advanced towards said mold cavity to advance said severed backing member to a portion of the periphery of said mold cavity; and

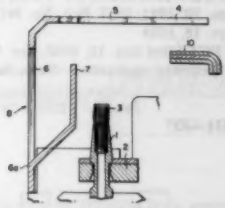
means for feeding molten plastic material into said mold cavity to fill said cavity to form said molded article and to adhere said severed backing member thereto, said drawing means operating after said punch means is moved out of severing cooperation with said cutting edge means to advance another portion of said strip of material into alignment between said punch means and cutting edge means.

4,466,788

ELECTRONIC GAS LIGHTER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Kanagawa, Japan

Filed Aug. 18, 1983, Ser. No. 524,363
Claims priority, application Japan, Mar. 19, 1982, 57-39132
Int. Cl.³ F23Q *7/12*
U.S. Cl. 431—255 **7 Claims**



1. An electronic gas lighter comprising a plastic body, a flame orifice cap having long side walls and short side walls and which is mounted on the body over a fuel outlet nozzle and has a flame orifice aligned with the nozzle and an electronic ignition means which generates spark discharge near the nozzle characterized in that at least one vent opening is provided in the side wall of the flame orifice cap and at least one heat dissipating plate is provided integrally with the flame orifice cap and spaced between the vent opening and nozzle and extending along the flow of fuel discharged from the fuel outlet nozzle.

4,466,789

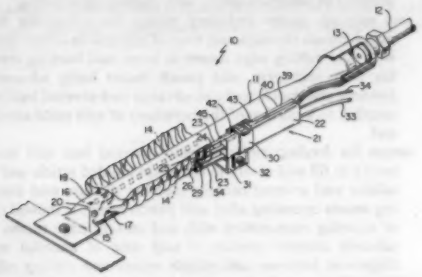
IGNITER/FLAME SENSOR ASSEMBLY FOR GAS BURNER

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 318,025, Nov. 4, 1981, abandoned. This application Oct. 26, 1983, Ser. No. 545,668
Int. Cl.³ H01T *13/08*
U.S. Cl. 431—264 **10 Claims**

1. In a fuel control system having a burner means provided with port means for issuing fuel therefrom, an electrical ignition probe means for igniting said issuing fuel by forming a spark gap with a ground electrode means and creating sparking thereacross, an electrically insulating means disposed adjacent said burner means and carrying said ignition probe means and said ground electrode means in a fixed relation relative to each other to define said spark gap therebetween whereby said

ground electrode means is separate from said burner means, and a support bracket carrying said insulating means so that said spark gap is fixed relative to said burner means, the improvement comprising a clamping means that clamps said ground electrode to said insulating means and secures said insulating means to said support bracket.



4,466,790

LIQUID-FUEL POT BURNER

Willem Godijn, Hilversum, Netherlands, assignor to Research Instituut Sesto B.V., Hilversum, Netherlands

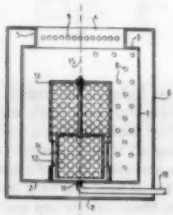
PCT No. PCT/NL80/00032, § 371 Date Jun. 10, 1981, § 102(e) Date Jun. 10, 1981, PCT Pub. No. WO81/01043, PCT Pub. Date Apr. 16, 1981

PCT Filed Oct. 10, 1980, Ser. No. 276,349

Claims priority, application Netherlands, Oct. 10, 1979, 7907496

Int. Cl.³ F23D *5/04*

U.S. Cl. 431—337 **8 Claims**



1. A pot burner for liquid fuel, comprising a pot having a top, a depending pot wall and a pot bottom, said top including a flame orifice defining a top passage area which is smaller than the pot passage area for fuel vapours in the pot, a jacket surrounding the pot, means for the supply of primary and secondary air to said pot passage area, a ring arranged concentrically with the pot wall and connected with the pot bottom for limiting the surface of the pot bottom to be wetted by liquid fuel, an orifice arranged centrally in the pot bottom for the supply of liquid fuel, a first cage fixed to and adjoining the ring and having an apertured sidewall, a second cage arranged concentrically inside the first cage and having a closed, imperforate top wall and an apertured sidewall, the lower side of said second cage extending inside the space defined by the ring and the pot bottom, the first cage extending to a higher level than the second cage, the first cage having a closed, imperforate top wall, and the second cage being spaced from and arranged without being in contact with the surface of the ring and the pot bottom.

4,466,791

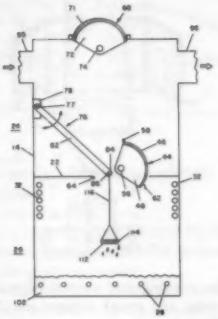
SINGLE VAPOR CONDENSATION SOLDERING FACILITY

Brian E. Jacobs, Collingswood Township, Camden County, N.J., and Edward J. March, Lower Makefield Township, Bucks County, Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 27, 1982, Ser. No. 437,058

Int. Cl.³ F27B *9/04, 15/00*; F26B *3/00, 11/18*

U.S. Cl. 432—23 **8 Claims**



8. A kit having component parts which are capable of being assembled to provide a drying chamber above a condensation heating chamber of a condensation soldering facility, said kit comprising:

a housing having a top, bottom and sidewalls;

sealable, arcuately shaped doors located in the top and bottom of the housing;

a drying system connectable to the housing for removing vapor therefrom; and

a transfer member which is pivotably mountable at a first end thereof within the chamber and adapted to receive articles through the top door on a second end of the transfer member which projects therethrough, to arcuately transfer said articles through the chamber and out the bottom door to the condensation heating chamber and vice versa.

4,466,792

WALKING BEAM FURNACE

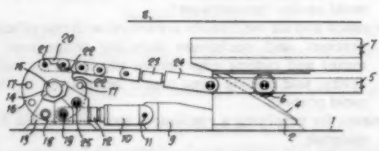
Corrado Ballabene, and Horst Dötsch, both of Erkrath, Fed. Rep. of Germany, assignors to Italimpianti Societa Italiana Impianti P.A., Genoa, Italy

Filed Nov. 5, 1982, Ser. No. 440,252

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144328

Int. Cl.³ F27B *9/14*; F27D *1/16*; B65G *25/00*

U.S. Cl. 432—122 **8 Claims**



1. A walking beam furnace of the type in which a hearth comprises a fixed beam and a walking beam, wherein the walking beam has associated therewith lifting roller means mounted on a lifting frame and which runs on an inclined ramp which extends downwardly by a distance longer than is neces-

sary for said walking beam to engage an object by an operative stroke, characterized by a drive-transmitting member (20, 27) for transmitting force connected at one end to said lifting frame (5) and at another end to a wheel means (16, 28) for imparting motion to said drive-transmitting member, said wheel means being mounted for rotation around a stationary axis.

4,466,793

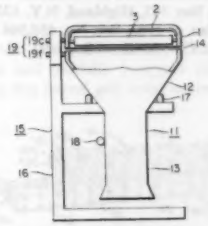
HEAT TREATMENT JIG FOR USE IN THE MANUFACTURE OF CATHODE-RAY TUBES

Yoshihiro Murakami, Kobe; Toyoshi Takeuchi, Ōtsu; Isao Ishii, Amagasaki; Tadaki Murakami, Minoo, and Hiroshi Takayanagi, Sanda, all of Japan, assignors to Mitsubishi Denki Kaisha, Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 482,046

Int. Cl.³ F27D *5/00*

U.S. Cl. 432—253 **1 Claim**



1. A heat treatment jig for use in the heat treatment of cathode-ray tubes, comprising:

a base; and

one or more heat resistant, electrically insulating support members rigidly secured to said base, said support members comprising mica, talc, orthoboric acid, boric acid anhydride, and zinc oxide molded under heat and pressure.

4,466,794

DENTAL SIMULATOR

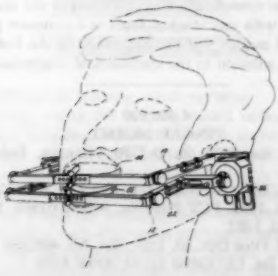
Walter G. Roup, 2425 Underwood, #360, Houston, Tex. 77030

Continuation of Ser. No. 176,198, Aug. 7, 1980, Pat. No. 4,368,041. This application Sep. 21, 1982, Ser. No. 420,645

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.³ A61C *19/04*

U.S. Cl. 433—69 **5 Claims**



1. A dental apparatus for mounting on the facial surfaces of the maxilla and mandible of a patient to record the movements of the patient's mandible comprising:

a first frame having two substantially horizontal receptacles having means for mounting adjacent to the patient's head above the occlusal plane formed by the meeting of the maxilla and mandible during closure and anterior to the temporomandibula joint, said first frame having an anterior portion having means for mounting on the facial surfaces of the maxilla and mandible, said receptacles having an opening toward said anterior portion;

a molding material disposed in said receptacles;

a second frame having two substantially horizontal styli disposed thereon having a portion thereof projecting into said receptacles in a direction extending posteriorly of said anterior portion, said styli indenting the molding material during movement of said second frame with the mandible in the horizontal, vertical and sagittal planes for recording three dimensional jaw movement, said portions of said styli received within said receptacles moving anteriorly within said receptacles as the patient opens the mouth and posteriorly as the patient closes the mouth.

4,466,795

HELICOIDALLY GROOVED DENTAL BURR

Gerhard Plischka, Graz, Austria, assignor to Dendia-Werk Dr. Ing. Hans O. Scheid Gesellschaft M.B.H., Vienna, Austria

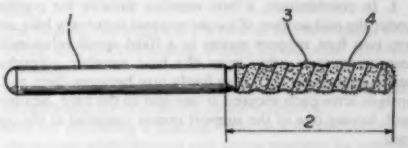
PCT No. PCT/AT81/00033, § 371 Date Sep. 13, 1982, § 102(e) Date Sep. 13, 1982, PCT Pub. No. WO82/02827, PCT Pub. Date Sep. 2, 1982

PCT Filed Dec. 29, 1981, Ser. No. 420,248

Claims priority, application Austria, Feb. 17, 1981, 730/81

Int. Cl.³ A61C *3/06*

U.S. Cl. 433—166 **5 Claims**



1. A dental burr having an elongate body centered on an axis, said body having a shank engageable by a chuck of a drilling machine rotating clockwise as viewed toward a tip of said body, a portion of said body between said shank and said tip having a working surface formed with a flat helicoidal strip of left-handed pitch terminating at said tip, said strip having a multiplicity of turns separated by turns of a continuous helicoidal groove.

4,466,796

DENTAL IMPLANT FOR USE AS A PILLAR IN A MOUTH

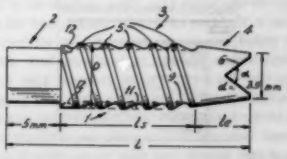
Sami Sandhaus, Lausanne, Switzerland, assignor to CBS Biotechnic SA, Switzerland

Filed Oct. 19, 1981, Ser. No. 312,824

Claims priority, application Switzerland, Oct. 20, 1980, 7810/80

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—173 **6 Claims**



1. A bioceramic dental implant for insertion in a prepared

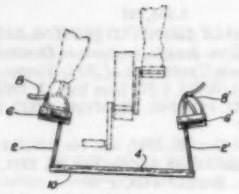
opening in the jaw bone for use as a pillar in a patient's mouth, having a head and a central portion provided with a plurality of successive circular recesses, wherein said central portion is generally cylindrically shaped and wherein each of the spires of said recesses on said cylindrical central portion are formed by a supporting cylindrical surface, a truncated conical surface and a concave circular arcuated surface, these three surfaces following one another in the above indicated sequence downwardly on the implant, the concave arcuate surface being following by the surface of the next spire.

4,466,797

TRAINING DEVICE FOR BICYCLISTS

Dalph D. Ray, 101 Scholz Plz. #217, Newport Beach, Calif. 92663

Filed Jul. 8, 1983, Ser. No. 512,028
Int. Cl.³ G09B *9/04*; A63B *69/16*
U.S. Cl. 434—61 **3 Claims**



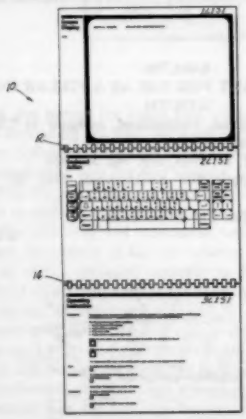
1. In combination, a base member suitable for positioning under the mid-section of a conventional stationary bike simulator; two foot support means in a fixed space relationship in respect to each other over the base member whereby the pedals of the simulator may freely turn between them and dual upright arms each secured at one end to the base member and each having one of the support means mounted at the oposite end.

4,466,798

PRINTED COMPUTER TRAINING DEVICE

James R. Conroy, Fairfield, Conn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 9, 1982, Ser. No. 396,816
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—118 **8 Claims**



1. A training device which includes leaves hingedly connected together, comprising:

a plurality of first leaves having screen display simulation indicia on a first side thereof,

a second leaf attached along its upper margin to the lower margin of a first one of said first leaves by a first common hinge means,

a plurality of third leaves having operating instruction indicia on a first side thereof,

a first one of said third leaves attached along its upper margin to the lower margin of said second leaf,

said first leaves and said third leaves having keyboard action simulating indicia on the second side thereof,

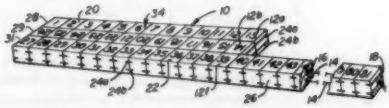
each of said keyboard action simulating indicia corresponding to one of said screen display simulation indicia on a first side of one of said plurality of first leaves.

4,466,799

CUBOID BLOCK, INSTRUCTIONAL DEVICE FOR MULTIPLICATION TABLES

Jason Argiro, Rd. 1, Box 367, Highland, N.Y. 12528

Filed Jan. 6, 1983, Ser. No. 455,966
Int. Cl.³ G09B *1/00, 19/02*
U.S. Cl. 434—203 **7 Claims**



1. A mathematical instruction device comprising:

a cuboid block string having a plurality of equal sized cuboid blocks with at least one exposed face having a numerical marking wherein said blocks are oriented on said string with said numerically marked faces in a common plane; and,

an articulated interconnection means interconnecting adjacent blocks in said string for select folding of predefined segments of consecutive blocks into multiples of uniformly aligned, conjunctive rows; and,

wherein successive blocks in said string have said numerical markings progressing in an increasing consecutive arithmetical series from a first end block marked one, to a second end block marked with a numerical marking equal to the total number of blocks in the string; and,

wherein for mathematical computations, said block string is folded at select points between adjacent blocks into multiple, uniformly aligned, conjunctive rows of preselected block segments commencing from said first end block in a continuous numerical series to a block at the end of a last segment, with said marked faces in a common plane, the numerical marking of the end block of the last segment being the solution to the mathmatical computation.

4,466,800

FINGER MODEL

Karl Breiden, Kopsbühl 60, D-7730 Villingen, Fed. Rep. of Germany

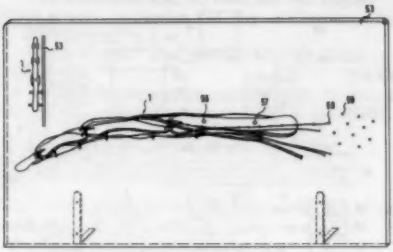
PCT No. PCT/DE81/00185, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982, PCT Pub. No. WO82/01954, PCT Pub. Date Jun. 10, 1982
PCT Filed Oct. 30, 1981, Ser. No. 405,956
Int. Cl.³ G09B *23/32*; A61F *1/06*
U.S. Cl. 434—267 **10 Claims**

1. An artificial finger having central and proximal phalanges and a metacarpale arranged with opposing articular facets therebetween defining corresponding joints, the finger further comprising:

a plurality of tendon-like cords connected to the phalanges

and the metacarpale in the vicinity of the joints for achieving movement thereat;

a plurality of cord receiving channel-like guides provided at the underside of the phalanges and metacarpale and arranged proximate the rims of the articular facets; and



a further cord attached to the upper surface of the proximal phalange and partially wrapped around the finger for allowing free lateral and volar movement thereof.

4,466,801

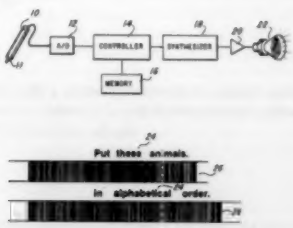
ELECTRONIC LEARNING AID WITH MEANS FOR REPEATING AN ELEMENT OF NONSPOKEN SOUND

Ashok Dittakavi, and Albert J. Olson, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 25, 1982, Ser. No. 381,988

Int. Cl.³ G09B 7/00

U.S. Cl. 434—335 **3 Claims**



1. An electronic learning aid comprising:

a scanning means for reading coded indicia, said coded indicia including first coded indicia corresponding to an element of nonspoken sound and second coded indicia indicative of a repeat command and a repeat number selected from a plurality of repeat numbers;

a control means for selecting speech synthesis data corresponding to said element of nonspoken sound upon reading first coded indicia and for repeat selection of said speech synthesis data, upon reading said second coded indicia a number of times corresponding to said repeat number; and

a speech synthesis means for generating a sound effect corresponding to said speech synthesis data selected by said control means.

4,466,802

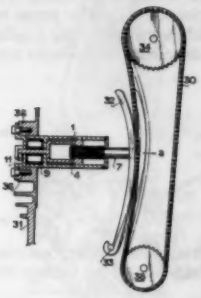
TENSION PROVIDING MECHANISM

Juji Ojima, Ebina, and Keiichi Suzuki, Yokohama, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Mar. 3, 1981, Ser. No. 239,990

Int. Cl.³ F16H 7/22, 7/12; F16D 65/38

U.S. Cl. 474—138 **5 Claims**



1. A tension providing mechanism comprising;

two shafts, a male screw portion formed at one end of one of said shafts and a female screw portion formed at one end of the other of said shafts, said two shafts being connected by engaging said both screw portions with each other, one of said shafts supported for axial translation without rotation;

a first bearing for supporting a first of the two shafts rotatively and for restraining sliding in the axial direction thereof;

a second bearing for supporting a second of the two shafts slidably and for restraining rotation thereof;

means for providing a pushing force in a fixed direction to the second shaft through said screw portions by applying a spring torque in a fixed rotative direction on said first shaft, said means for applying a pushing force comprises a spiral spring having an inner end fixed to a split groove formed in an axial portion of the first shaft and an outer end fixed to the inner wall of the case; and

a locking mechanism for constraining movement of said first shaft and being composed of a lever having one end thereof removably engaged with the split groove of the axial end of the first shaft which penetrates through the plate member which blocks the lower end opening of said case and another end latched to a projection formed on said case.

4,466,803

BELT TENSIONER AND METHOD OF MAKING THE SAME

Leslie B. Wilson, Reeds Spring, Mo., assignor to Dayco Corporation, Dayton, Ohio

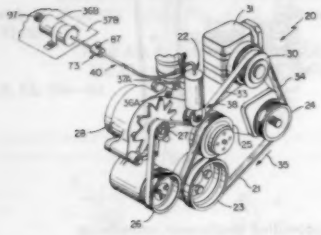
Filed Aug. 27, 1981, Ser. No. 296,693

Int. Cl.³ F16H 7/12, 7/10; F16F 9/16, 9/48

U.S. Cl. 474—138 **3 Claims**

1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, and mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, the improvement comprising a fluid operated transmitting means operatively associated with said spring means and said belt engaging means for translating motion therebetween whereby said spring means is adapted to be disposed remote

from said belt engaging means, said fluid operated transmitting means for translating motion comprising a conduit means having a flow control device for controlling the flow rate of fluid through said conduit means in at least one direction of flow therethrough, a first piston and cylinder means operatively associated with said spring means, and a second piston and cylinder means operatively associated with said belt engaging means, said conduit means fluidly interconnecting said first and second piston and cylinder means together, said first piston and cylinder means comprising a cylinder member and a piston member disposed in said cylinder member, one of said



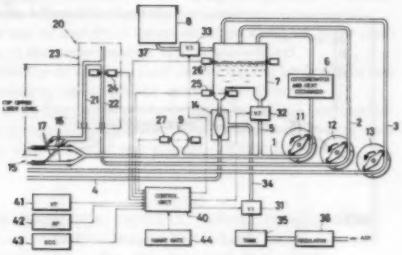
members being adapted to be movable relative to the other of said members whereby said other of said members comprises part of said support means, said spring means engaging and acting between said support means and said one of said members, said second piston and cylinder means comprising a cylinder member and a piston member disposed in said cylinder member, one of said members of said second piston and cylinder means being interconnected to said belt engaging means and being adapted to be movable relative to the other of said members thereof whereby said other of said members thereof comprises part of said support means.

4,466,804

EXTRACORPOREAL CIRCULATION OF BLOOD

Tsunekazu Hino, 2513, Hino, Hino-shi, Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,381
Int. Cl.³ A61M *1/03*
U.S. Cl. 604—4 **18 Claims**



1. In an extracorporeal blood circulation system including:
a blood withdrawing line,
an artificial lung provided on the line,
a reservoir for the blood withdrawn,
a blood supply line for sending out the blood from the reservoir, and
a blood supply pump provided on the blood supply line; an apparatus for adjusting the amount of blood to be withdrawn comprising:
means for detecting that the venous pressure has exceeded a predetermined upper limit level,
a blood withdrawing pump provided on the blood withdrawing line, a shunt line connecting the reservoir to the inlet side of the blood withdrawing pump, a valve provided on the shunt line and usually open, and a valve control circuit for closing the valve when the venous pressure has exceeded the upper limit level.

4,466,805

HAIRDYEING COMPOSITION AND METHOD

Reiner Welters, Darmstadt; Gernot Möschl, Weiterstadt, and Hans-Dieter Allardt, Seeheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 907,475, May 19, 1978, abandoned.
This application Aug. 20, 1980, Ser. No. 180,060
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722725
Int. Cl.³ D06P 3/04; A61K 7/42, 7/44, 7/021
U.S. Cl. 8—406 10 Claims

1. A hairdyeing composition comprising an amount, effective to dye hair, of at least one compound of formula II

$$R^7—C(R^2)=C(R^3)—C(R^4)=C(R^5)—R^7 \quad (II)$$

wherein

R^7 is $—CH(OR^{12})_2$; R^{12} is C_{1-8} alkyl; and R^2, R^3, R^4 and R^5 independently are hydrogen, methyl or ethyl;

and an adjuvant acceptable in cosmetics.

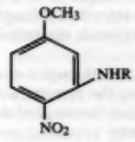
4,466,806

DYEING COMPOSITIONS CONTAINING 3-AMINO-4-NITROANISOLE DERIVATIVES AND THEIR USE IN DYEING KERATIN FIBRES AS WELL AS CERTAIN NEW SAID DERIVATIVES

Andrée Bugaut, Boulogne-Billancourt, and Patrick Andrillon, Chelles, both of France, assignors to L'Oreal, Paris, France

Filed Aug. 7, 1981, Ser. No. 291,099
Claims priority, application France, Aug. 8, 1980, 80 17618
Int. Cl.³ A61K 7/13
U.S. Cl. 8—414 28 Claims

1. A composition suitable for dyeing human hair which comprises an aqueous, alcoholic or aqueous-alcoholic vehicle and 0.001 to 5% by weight, relative to the total weight of the composition, of at least one compound of the general formula:



(I)

in which R denotes a monohydroxyalkyl radical containing from 2 to 6 carbon atoms or a polyhydroxyalkyl radical containing from 3 to 6 carbon atoms.

4,466,807

MANUFACTURE OF A GAS CONTAINING MONOXIDE AND HYDROGEN GAS FROM A STARTING MATERIAL CONTAINING CARBON AND/OR HYDROCARBON

Sven Santén, and Börje Johansson, both of Hofors, Sweden, assignors to SKF Steel Engineering Aktiebolag, Hofors, Sweden

Filed Nov. 25, 1981, Ser. No. 324,695
Claims priority, application Sweden, Mar. 10, 1981, 8101496
Int. Cl.³ C10J 3/18, 3/46
U.S. Cl. 48—197 R 7 Claims

1. A method of manufacturing a gas containing carbon monoxide and hydrogen gas in a shaft reactor from a starting material containing carbon and/or hydrocarbon, comprising injecting the starting material in powder or liquid form together with an oxidizing agent and slag former into a combustion zone in the lower portion of the shaft reactor, said combustion zone being formed in the lower portion of said shaft by injecting a plasma gas from a plasma generator into said lower portion,

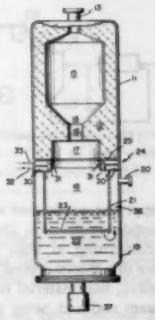
said shaft being maintained substantially filled with particulate, solid, carbonaceous material and sulphur-binding slag former.

4,466,808

METHOD OF COOLING PRODUCT GASES OF INCOMPLETE COMBUSTION CONTAINING ASH AND CHAR WHICH PASS THROUGH A VISCOUS, STICKY PHASE

Wolfgang Koog, Pleasantville, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,821
Int. Cl.³ C10J 3/46; C10K 1/10
U.S. Cl. 48—197 R 4 Claims



1. The method of cooling from an initial high temperature of 1800° F.–3500° F. to a final low temperature a hot synthesis gas containing particles including ash and char which pass through an undesirable viscous, sticky phase on cooling through an intermediate viscous-sticky temperature range of 1000° F.–2000° F. which comprises

passing hot synthesis gas containing ash and char at initial high temperature downwardly through a first contacting and cooling zone;

passing cooling liquid downwardly as a film on the walls of said first contacting zone and in contact with said downwardly descending synthesis gas thereby cooling said synthesis gas;

spraying cooling liquid into said downwardly descending synthesis gas containing particles thereby cooling said particles to a temperature below the said intermediate temperature range of 1000° F.–2000° F. as said synthesis gas is cooled;

separating at least a portion of said cooled particles from said gas at the lower terminus of said first contacting zone;

collecting at least a portion of said cooling liquid in a body at the lower terminus of said first cooling zone;

withdrawing from said body of cooling liquid a portion thereof containing cooled particles;

passing said synthesis gas leaving said first contact zone into contact with said body of cooling liquid thereby vaporizing at least a portion of said cooling liquid and forming a mixture of vaporizing cooling liquid and synthesis gas;

passing said mixture of vaporizing cooling liquid and synthesis gas through a second cooling zone wherein said synthesis gas is cooled to desired outlet temperature;

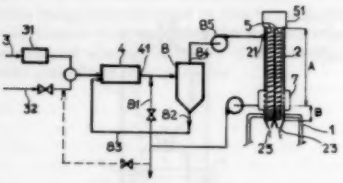
separating said cooled synthesis gas from said cooling liquid; and

recovering said cooled synthesis gas.

4,466,809
FUEL SUPPLY METHOD FOR A GASIFICATION CHAMBER

Rolande Kissel, Le Vesinet; Pierre Berger, Saint-Etienne, and Gérard Chrysostome, Montchanin, all of France, assignors to Creusot-Loire, Paris, France

Filed May 3, 1982, Ser. No. 374,217
Claims priority, application France, May 8, 1981, 81 09244
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R **5 Claims**

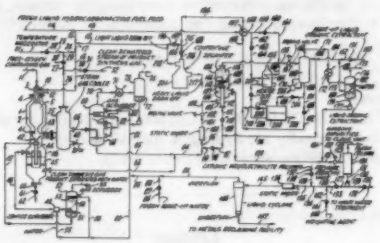


1. Method of supplying particulate solid fuel material to a pressurized combustion-gasification chamber by means of a screw conveyor comprising at least two screws rotatably driven at the interior of a sleeve debouching at its downstream end into said chamber, said material being charged into said sleeve at its upstream end and being moved by said screws toward said downstream end, said material passing into a compression zone located at said downstream end so as to form a fluid-tight plug of compressed material introduced into said chamber and continuously renewed by material arriving from upstream, characterized in that said material is first mixed outside of said screw conveyor with a liquid phase constituting a moderator combustion fluid so as to form a mixture containing at least 40% by weight of liquid phase, said mixture then being charged by pumping into the inlet of said screw conveyor, said screws having different threading defining a drive zone in the downstream direction and a compression zone in which said fluid-tight plug is formed by expulsion of said liquid phase and compression of said combustible material, the flow rate of feeding said mixture and the speed of rotation of said screws being mutually adjusted in such manner as to maintain at the outlet of said screw conveyor a substantially constant pressure corresponding to a substantially constant proportion of liquid phase of at most 15%, any excess of said liquid phase beyond said proportion being expelled upstream and evacuated by filtering parts arranged in said sleeve upstream of said compression zone.

4,466,810
PARTIAL OXIDATION PROCESS

Roger M. Dille, Port Arthur, Tex.; George N. Richter, San Marino; Lawrence E. Estabrook, Whittier, both of Calif.; Jean-Georges P. Rohner, Zurich, Switzerland, and Harold A. Rhodes, Beaumont, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 29, 1982, Ser. No. 445,388
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R **22 Claims**



1. In a process for the partial oxidation of a hydrocarbonaceous fuel, slurry of carbonaceous fuel, or mixtures thereof, said fuel containing metal impurities, with a free oxygen-containing gas in the reaction zone of a free-flow noncatalytic gas generator at a temperature in the range of about 1700° to 3500° F. and a pressure in the range of about 1 to 300 atmospheres in the presence of a temperature moderator to produce a raw gas stream comprising H_2, CO, H_2O and at least one gas from the group CO_2, N_2, Ar, H_2S, CH_4 and COS, and containing entrained soot, particulate carbon and ash; and contacting the raw gas stream with water in quenching and/or scrubbing zones to produce a soot-water dispersion, the improved method for preventing the build-up of ash in the system comprising:

(1) simultaneously passing a stream of said soot-water dispersion and a stream of liquid organic extractant through an in-line static mixer thereby providing gentle non-turbulent mixing together of said streams;

(2) passing the mixture leaving (1) directly through a mixing valve while simultaneously dropping the pressure across the valve to produce a pressure drop in the range of about 40 to 500 kilo pascals (kpa) thereby providing severe turbulent mixing;

(3) introducing the mixture from (2) into a decanter with the simultaneous introduction of a separate stream of liquid organic extractant, and settling in separate layers a grey water-ash dispersion including about 70–85 wt. %, or more of the total ash present in the decanter feed and a particulate carbon-soot-liquid organic extractant dispersion including the remaining ash;

(4) separately removing each of said dispersions from the decanter;

(5) flashing off gaseous impurities from the grey water-ash dispersion from (4) in a degassing zone;

(6) introducing about 80 to 100 wt. % of the degassed grey water-ash dispersion from (5) into a solids-liquid separating zone comprising at least one solids-liquid separator selected from the group consisting of liquid cyclone, centrifuge, gravity thickener or clarifier, filter, and combinations thereof where at least a portion of the water-insoluble ash is removed to produce deashed grey-water;

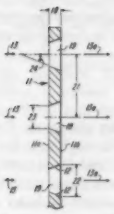
(7) introducing any remaining degassed grey water-ash dispersion from (5) into a waste water treatment facility; and

(8) introducing at least a portion of the deashed grey water from (6) directly into the gas quenching and/or scrubbing zones.

4,466,811
MOLECULAR VELOCITY VECTOR BIASING METHOD AND APPARATUS FOR GASES

Herbert E. Johnson, III, 851 14th St., Boulder, Colo. 80302

Filed Aug. 9, 1982, Ser. No. 406,433
Int. Cl.³ B01D *59/18*
U.S. Cl. 55—17 17 Claims



1. Biasing apparatus for changing the direction of molecular velocity vectors of a flowing gas comprising:

a biasing member having opposed faces with a matrix of tapered holes, each said hole extending from a smaller opening in one face to a larger opening in the opposite face to provide a plurality of closely spaced biasing surfaces which are divergingly inclined in relation to the centerline of the hole to increase the velocity of the gas flow through the hole to bias the molecular velocity distribution of the gas molecules in the direction of the gas flow through each hole as a result of said gas molecules rebounding from said surfaces in a diffuse pattern according to the cosine law of distribution with the directions substantially centered along a line normal to the inclined surface for increasing the velocity of gas flow along the centerline of the hole and exerting a thrust on said member in the opposite direction,

said opposed faces of said biasing member being closed to gas flow between said tapered holes,

said tapered holes having a diameter in the range of about 0.01 mm to 1.0 mm, a center to center distance in the range of about one to five times hole diameter, and an average hole diameter greater than hole length.

16. A biasing method for changing the direction of the molecular velocity vectors of a flowing gas comprising the steps of:

positioning a plurality of inclined surfaces provided by a biasing member having opposed faces with a matrix of tapered holes, each said hole extending from a smaller opening in one face to a larger opening in the opposite face, in the path of said stream of gas flow to bias the molecular velocity vector distribution of said stream of flowing gas to increase the velocity of said gas flow when the surface is divergingly inclined and decrease the velocity when the gas flow is convergingly inclined,

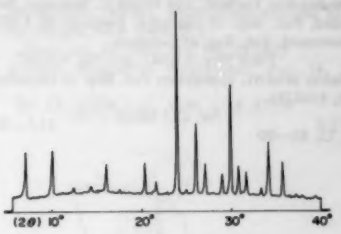
said opposed faces of said biasing member being closed to gas flow between said tapered holes,

said tapered holes having a diameter in the range of about 0.01 mm to 1.0 mm, a center to center distance in the range of about one to five times hole diameter, and an average hole diameter greater than hole length.

4,466,812
ZEOLITE ENCAPSULATING MATERIAL

Tetsuo Takaishi, Toyohashi; Keiji Itabashi, Sagamihara; Satoru Morishita, Kodaira, and Hisashi Hatotani, Tokyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Continuation of Ser. No. 188,942, Sep. 19, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,034
Claims priority, application Japan, Apr. 2, 1980, 55-41938
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—68 3 Claims



3. A method for occluding hydrogen comprising contacting hydrogen, at a pressure of 100 kg/cm²G at a temperature of 300° C. or less, with a zeolite, said zeolite having a composition expressed by a typical unit cell: $(Csx\ MIIy\ Naz)(AlO_2.SiO_2)_{12}\cdot(NaAlO_2)\delta\cdot\omega H_2O$, in which MII represents a divalent metal, $0<\delta<$, ω represents a positive number and x, y and z which respectively represent in said unit cell the numbers of cesium, the divalent metal and sodium having the following relation:

$$x+2y+z=12$$

$$3\leqq x<10$$

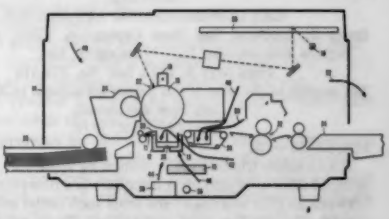
$$0<4\leqq 4.5$$

said divalent cations being substantially present at sites other than 8-member oxygen rings of said zeolite, whereby said hydrogen is encapsulated and occluded by the zeolite A.

4,466,813
PLASTICIZER REMOVAL PROCESS AND SYSTEM

Michael D. Avritt, and Michael M. Farrow, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,718
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—74 8 Claims



1. In a copier wherein airflow within the copier housing is directed at least in part along a path from at least one internal copier component to the copier photoconductor wherein said component releases into the airflow path contaminants with respect to the copier photoconductor, an improvement to prevent said airborne contaminants from contaminating said photoconductor comprising:

air permeable means operable to entrap said contaminants having an ability to contaminate said photoconductor by at least partially preventing normal deposition and removal of toner on said photoconductor; and

means mounting said entrapping means in said airflow path for intercepting said contaminants before the air engages the photoconductor.

4,466,814

PROCESS AND APPARATUS FOR CONDITIONING SALIFEROUS ATMOSPHERIC INTAKE AIR

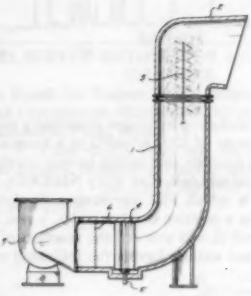
Hans-Joachim Herbort, and Heinz G. Schuster, both of Dortmund, Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,317

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145291

Int. Cl.³ B01D *47/06*

U.S. Cl. 55—90 **5 Claims**



1. A process for conditioning saliferous atmospheric intake air for use in floating chemical plants, comprising the steps

a. circulating the inlet air through a closed conditioning zone to a drop separator and from the drop separator to the chemical plant;

b. charging a salt-free water spray into the circulating air before it reaches the drop separator to cause any salt particles contained in the intake air to pass into the sprayed water; and

c. preheating the circulated air discharged from the drop separator, before it is circulated to the chemical plant, to reduce the relative humidity thereof, whereby a purified air which is free of salt and water drops is produced and circulated to the chemical plant.

4,466,815

GAS CONDITIONING APPARATUS

Barry J. Southam, San Juan Capistrano, Calif., assignor to Wahlco International Inc., Wilmington, Del.

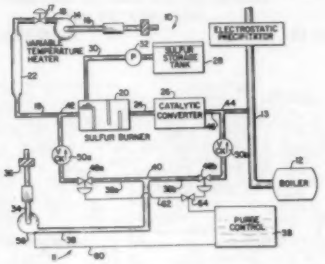
Filed May 3, 1982, Ser. No. 374,516

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.³ B03C *3/16*

U.S. Cl. 55—122 **9 Claims**

1. In a sulfur trioxide gas conditioning apparatus wherein an induced flow of heated air is directed via a flowpath extending between an inlet and outlet and from such outlet into a flue for conditioning of flue gases containing flyash by injecting a controlled amount of sulfur trioxide gaseous mixture to vary the resistivity of such flyash, such induced air flow, as it flows along said flowpath, passes through conversion means to produce an air and sulfur trioxide mixture for use in the conditioning of such flue gases and which conditioning apparatus includes a purge means for purging, on demand, at least a downstream portion thereof of sulfur trioxide gaseous mixture therefrom, the improvement in said purge means comprising: a purge air flow induction means; a first purge air conduit means for directing purge air flow into said flowpath upstream from said conversion means; second purge air flow conduit means for directing purge air flow into said flowpath downstream from said conversion means; selectively operable valve means



for selectively directing purge air flow from said purge air flow induction means through said first and said second purge air flow conduit means and for selectively isolating said purge air flow induction means from said flowpath; and said selectively operable valve means includes a respectively operable valve in each of said first and second purge air flow conduit means.

4,466,816

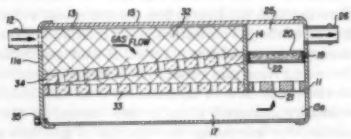
CONDENSER FILTER INSERT FOR MUFFLERS FOR INTERNAL COMBUSTION ENGINES

George A. Felker, 873 Davis Ave., Pottsville, Pa. 17901

Filed Nov. 4, 1982, Ser. No. 439,222

Int. Cl.³ B01D *51/00*

U.S. Cl. 55—267 **4 Claims**



1. A condenser filter device for an internal combustion engine for controlling exhaust emissions comprising:

a hollow body enclosed by a housing and by lateral end walls;

a baffle extending from the upper portion of said housing towards the lower portion of said housing, an elongated hollow chamber formed between said baffle and the first lateral end wall, said chamber having its walls lined with a heat-resistant material, an inlet in first lateral end wall for introducing into said elongated chamber a gaseous stream of exhaust emissions including particles resulting from combustion;

a first screen in said elongated chamber and supported between the baffle and the first lateral end wall, so that said gaseous stream and particles entering said elongated chamber must pass through said first screen;

a second screen at the lower end of said elongated chamber and supported between the baffle and the first lateral end wall, so that said gaseous stream and particles passing through said first screen must pass through said second screen;

a lower chamber in said body formed between the first and second lateral end walls and in communication with the lower end of said elongated chamber, said first lateral end wall having an opening, with a removable plug, at the lower end of said first lateral end wall, said lower chamber

forming a sump into which the said particles may fall by gravity;

a third screen disposed above said lower chamber and oppositely of said elongated chamber and supported between the baffle and the second lateral end wall, so that said gaseous stream and remaining particles passing through said lower chamber must pass through said third screen;

a fourth screen disposed above said third screen and oppositely of said elongated chamber and supported between the baffle and the second lateral end wall, so that said gaseous stream and remaining particles passing through said third screen must pass through said fourth screen;

a filter disposed above said fourth screen and oppositely of said elongated chamber and supported between the baffle and the second lateral end wall, so that said gaseous stream and remaining particles passing through said fourth screen must pass through said filter;

said gaseous stream and particles flowing downwardly through the elongated chamber, the first screen, and the second screen, then laterally through the lower chamber, and then upwardly through the third screen, fourth screen, and said filter, the latter helping to remove any remaining particles from said stream and allowing said particles to fall by gravity into said sump;

and an outlet in said second lateral end wall above the said filter for allowing the now purified gaseous stream to be released from said body into the atmosphere.

4,466,817
EXHAUST GAS SEPARATOR

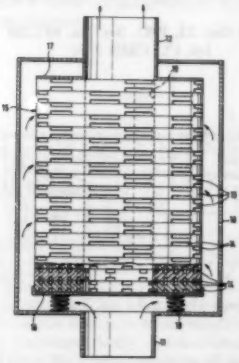
Harald Faas, Remshalden-Geradstetten; Ditrich Lenzen, Sachsenheim; Hans Weik; Albrecht Ostermann, both of Öhringen, and Wolfgang Reimann, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Knecht Filterwerke GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 281,561, Jul. 8, 1981, abandoned. This application Jun. 21, 1982, Ser. No. 390,369

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027499

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—455 **6 Claims**



1. An exhaust gas separator for an internal combustion engine comprising:

(a) an elongate housing having an inlet and an outlet, and

(b) annular disks disposed within said housing between said inlet and outlet,

(c) each of said annular disks being provided on both side surfaces with at least one open flow channel which extends in the form of a spiral between the external periphery of each disk and its interior to provide communication between the exterior of each disk and its interior opening,

(d) said annular disks being arranged in a series and bear axially one against the other whereby the abutting side surfaces of adjacent disks serve to close the flow channels in said side surfaces,

(e) the spiral form of one of the flow channels in one of said abutting side surfaces extending in the opposite sense to the spiral form in the other of said abutting side surfaces whereby said flow channels in said abutting side surfaces intersect each other at numerous positions.

4,466,818
DOUBLE CRUCIBLE METHOD OF FABRICATING OPTICAL FIBERS

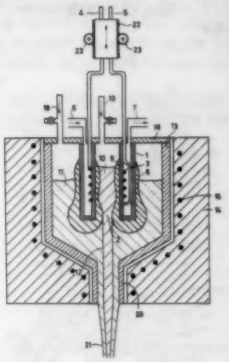
Hidde H. Brongersma, Waalre, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,919

Claims priority, application Netherlands, Jun. 16, 1981, 8102878

Int. Cl.³ C03B *5/02, 5/26, 5/44, 37/09*

U.S. Cl. 65—3.13 **5 Claims**



1. A method of fabricating optical fibers comprising a core glass and a cladding glass, said method comprising the steps of:

providing first and second crucibles, the first crucible being within the second crucible, each crucible having an outlet opening;

providing a core glass within the first crucible and providing a cladding glass within the second crucible;

heating the core glass and the cladding glass;

flowing the heated core glass through the outlet opening of the first crucible and through the cladding glass to produce a composite of the core glass surrounded by the cladding glass; and

flowing the composite glass through the outlet opening of the second crucible and drawing the composite glass to produce an optical fiber;

characterized in that:

the core glass is heated by a high-frequency electric field;

the first crucible is made of a material having low dielectric losses at the frequency of the electric field; and

the first crucible is cooled to form a layer of solid glass thereon while the core glass is heated.

3. An apparatus for fabricating optical fibers comprising a core glass and a cladding glass, said apparatus comprising:

first and second crucibles, the first crucible being arranged within the second crucible, each crucible having an outlet opening, the outlet openings being arranged on an axis; and

means for heating the contents of the first and second crucibles;

characterized in that:

the first crucible has a double-wall construction with a space inside the double-wall;

the heating means for heating the contents of the first cruci-

ble comprises an electrically conducting coil arranged in the space inside the double-wall; and

the apparatus further comprises means for passing a cooling fluid through the space inside the double-wall.

4,466,819

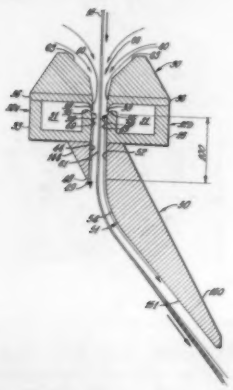
METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS GLASS FILAMENT MAT

Michael P. Dunn, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 11, 1983, Ser. No. 522,882

Int. Cl.³ C03B *37/06*

U.S. Cl. 65—4.4 **12 Claims**



1. Apparatus for producing a mat of continuous glass filaments comprising:

(a) feeder means for supplying a plurality of streams of molten glass;

(b) pull roll means for drawing streams into said filaments;

(c) means for orienting said filaments as a planar band;

(d) a collection surface for collecting said filaments as said mat; and

(e) distribution means for receiving said band from the pull roll means comprising:

a first blower means adapted to supply a stream of gas;

a second blower means adapted to supply a stream of gas, said second blower means being spaced from said first blower means, said filaments advancing from said pull roll means between said first and second blower means;

a first control surface having a tapered, receding arcuate section, said arcuate section having a finger extending therefrom to direct some of said filaments toward an edge of said mat, said first control surface being associated with said first blower means; and

a second control surface having a tapered, receding arcuate section, said arcuate section having a finger extending therefrom to direct some of said filaments toward the other edge of said mat, said second control surface being associated with said second blower means, said tapered, receding arcuate sections being diagonally opposed to direct said gaseous streams to orient said advancing filaments as a diverging planar array for collection as said mat.

4,466,820

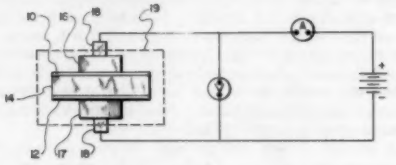
ELECTROLYSIS TREATMENT FOR DRAWING IONS OUT OF A CERAMIC

David R. Clarke, Cambridge, Mass., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 18, 1983, Ser. No. 514,718

Int. Cl.³ C25F *1/00*

U.S. Cl. 65—30.14 **3 Claims**



1. A method of drawing ions out of a ceramic which has a glassy intergranular phase, comprising the steps of:

providing a ceramic having grains of a crystalline material surrounded by a very thin non-crystalline glassy intergranular phase, said intergranular phase comprising only a few percent of the total volume of said ceramic;

heating said ceramic to a temperature at which the ions have mobility in said intergranular phase;

applying an electric field across said ceramic while said ceramic is at said temperature;

holding said ceramic at said temperature and at said field so that ions can be drawn to the sides of said ceramic under the influence of said electric field;

cooling said ceramic and removing said electric field; and

removing material from the surface of said ceramic.

4,466,821

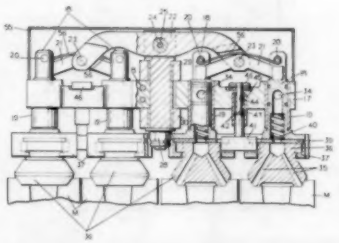
BAFFLE MOVING AND ALIGNMENT MEANS FOR THE FOUR GOB GLASS FORMING MACHINE

George W. Irwin, Holland, Ohio, and Eustace H. Mumford, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1982, Ser. No. 452,229

Int. Cl.³ C03B *9/36*

U.S. Cl. 65—307 **7 Claims**



1. A glassware forming machine having at least one section including four side-by-side upwardly open parison molds which are closed by baffles, a baffle supporting arm, said arm being elongated and provided with four individual baffle holders as adjacent pairs, said holders extending through vertical bushings in the arm, and being vertically movable therein; first and second pivoted equalizer bars each of which has its ends engaging said adjacent pairs of said holders, a horizontal pin extending through each holder and overlying the end of the first or second equalizer bar that is in engagement with the holder, a third larger equalizer bar pivotally mounted for rocking movement relative to said baffle support arm, and

means pivotally supporting each of said first and second equalizing bars, intermediate its length, at each end of the said larger equalizer bar thereby connecting said first and second equalizer bars to said larger equalizer bar.

2. The apparatus of claim 1 further including spring means extending beneath and between the horizontal pins in each adjacent pair of holders for urging the holders in the upward direction to maintain the holders in engagement with the end of the equalizer bars.

4,466,822

COMPOSITIONS, WHICH PROMOTE PLANT GROWTH AND PROTECT PLANTS, BASED ON OXIME ETHERS AND OXIME ESTERS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 881,953, Feb. 27, 1978, abandoned. This application Mar. 11, 1980, Ser. No. 129,499

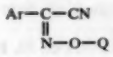
Claims priority, application Switzerland, Mar. 2, 1977, 2606/77; Feb. 8, 1978, 1348/78

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.³ A01N *21/02, 9/20;* C07C *121/66, 121/70*

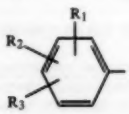
U.S. Cl. 71—77 36 Claims

1. A compound of the formula



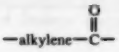
wherein

Ar represents a phenyl group of the formula

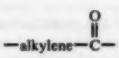


or an alpha- or beta-naphthyl group,

Q represents a lower alkanecarboxylic acid ester group of the partial formula



in which "alkylene" has from 1 to 4 carbon atoms and in which the alcohol moiety has from 1 to 8 carbon atoms, or represents a lower alkanecarboxylic acid amide group of the partial formula



in which "alkylene" has from 1 to 4 carbon atoms and in which the amine moiety is mono-substituted or symmetrically or unsymmetrically di-substituted by a member selected from the group consisting of lower alkyl, lower alkenyl, propynyl and butynyl or in which the amine is mono-substituted by phenyl which is optionally itself substituted by a member defined for R_2/R_3,

R_1 represents hydrogen, halogen, lower alkyl, lowwer alkoxy, or a phenoxy group which is in the para position and which is optionally substituted a maximum of twice by halogen, CN, NO_2 or CF_3, and

R_2 and R_3 independently of one another represent hydrogen, halogen, NO_2, lower alkyl, trifluoromethyl or lower alkoxy.

19. A process for promoting plant growth by applying to the plant, to a part thereof or to the habitat thereof, a growth promoting effective amount of a compound according to claim 1.

29. A process according to claim 19, in which the plant seed or the germinated seed is treated.

4,466,823

CONTROL OF UNWANTED SICKLEPOD PLANTS

Kurt G. R. Sundelin, and Gene A. Bozarth, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 18, 1983, Ser. No. 552,957

Int. Cl.³ A01N *37/10*

U.S. Cl. 71—115 1 Claim

1. A method for controlling unwanted sicklepod plants which comprises subjecting the plants to an effective dosage of the (R*,S*)-(+)- optical isomer of 4-benzoyl-2,3-diphenylbutyric acid.

4,466,824

TRANSFERRED-ARC PLASMA REACTOR FOR CHEMICAL AND METALLURGICAL APPLICATIONS

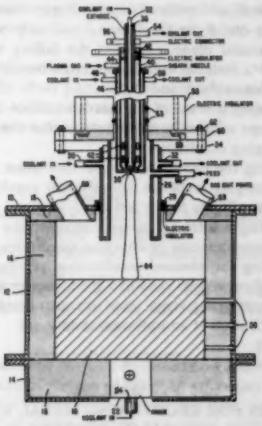
William H. Gauvin, Beaconsfield, and George R. Kubanek, Baie d'Urfé, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed May 26, 1982, Ser. No. 382,415

Claims priority, application Canada, Jul. 30, 1981, 382889

Int. Cl.³ C22B *4/00*

U.S. Cl. 75—10 R 10 Claims



1. A transferred-arc plasma reactor for chemical and metallurgical applications comprising:

(a) a bottom portion defining a crucible for collecting molten material;

(b) an anode mounted in the crucible and adapted to contact the molten material in the crucible;

(c) a sleeve mounted on the top of said crucible and electrically insulated therefrom and thus from the anode which is mounted in the crucible;

(d) a cathode assembly including a cathode mounted on top of said sleeve and electrically insulated therefrom;

(e) means for introducing feed material conveyed by a carrier gas near the top of said sleeve so that the feed material is fed against the inner wall of the sleeve, melting under the heating energy radiated by a plasma column formed between the cathode and the anode via the molten material in the crucible to form a falling film of molten material which flows down along the inner wall of the sleeve and drops into the crucible underneath;

(f) exit ports in the bottom portion of the reactor for exiting the plasma and carrier gases; and

(g) means for tapping the molten material from the crucible.

4,466,825

PROCESS FOR BLAST FURNACE OPERATION

Mikio Kondo, and Kyoji Okabe, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation-in-part of Ser. No. 267,785, May 28, 1981, abandoned. This application Jul. 29, 1983, Ser. No. 518,311
Claims priority, application Japan, May 30, 1980, 55-71414
Int. Cl.³ C21B *5/00*
U.S. Cl. 75—41 **4 Claims**

1. A process for blast furnace operation, in which procedures of charging burden material into a blast furnace are periodically repeated for every cycle of batches within which combinations of charging conditions such as kind of burden material, weight and volume of burden material, stock line level, and either movable armour position or rotating velocity and tilting angle of a distributing chute make a round, and a burden distribution is controlled by planning and executing combinations of charging conditions contained in a cycle of batches, which process comprises:

simulating the burden distribution for a planned combination of charging conditions in the following manner before executing them:

calculating a falling trajectory of a burden material for the combination of charging conditions before a volume of the burden material is charged into the furnace, assuming that a surface of the burden material in the furnace has an angle of inclination θ_1 in the furnace center side and another one θ_2 in the furnace wall side with respect to a horizontal plane, and that the falling trajectory of the burden material collides against a bending position of the burden surface; and

calculating a level of the burden surface according to the volume of the burden material for the combination of charging conditions;

repeating the above-mentioned simulation in regular order of charging sequence from the first combination of charging conditions to the last one;

estimating a total of the simulated burden distributions for the combinations of charging conditions; and

executing the planned combination of charging conditions based on results obtained from the simulating, repeating and estimating steps, so as to control and hold the burden distribution at an optimum state.

4,466,826

PROCESS FOR RECOVERING METAL VALUES FROM ALLOY SCRAPS

Osmo Vartiainen, Helsinki, Finland, assignor to OV-Eng Oy, Helsinki, Finland

Filed Jan. 27, 1983, Ser. No. 461,454
Int. Cl.³ C22B *23/06*
U.S. Cl. 75—63 **10 Claims**

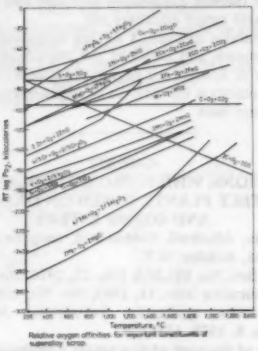
1. A process for selectively recovering metal values from nickel or cobalt based alloy scrap containing chromium and tungsten, by mixing a melt of the scrap with oxidizing and slaggin agents and separating slags from molten metal, comprising:

(a) first oxidizing the metal melt to such an extent that tungsten will remain substantially unoxidized, maintaining a slag basicity of 2–2.5%, and removing a chormium containing slag so formed;

(b) further oxidizing the metal melt from step (a) to such an extent that tungsten passes into a slag and removing a slag containing chromium and tungsten so formed;

(c) further oxidizing the metal melt from step (b) at a slag basicity of 1.5–2.0 to bring the chromium content thereof to 0.5–1% and removing the slag so formed;

(d) repeatedly oxidizing the metal melt from step (c) in admixture with a sodium containing slagging agent to obtain a slag basicity of 2.5–3, and removing a slag after



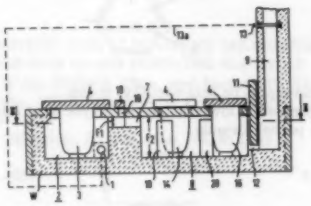
each treatment in order to produce a substantially pure alloy melt of cobalt, nickel, or both.

4,466,827

METHOD FOR MELTING METALS

Josef Zeug, Nachtigallenweg 13, 7030 Böblingen-Tannenberg, Fed. Rep. of Germany

Division of Ser. No. 221,258, Dec. 30, 1980, Pat. No. 4,378,105. This application Mar. 16, 1983, Ser. No. 475,939
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004906
Int. Cl.³ C22B *21/00*
U.S. Cl. 75—65 R **3 Claims**



1. An improved method of operating a melting furnace, for melting metals and metal alloys, said melting furnace comprising:

a. furnace chamber;

b. a first melting vessel disposed within said furnace chamber;

c. means to produce hot combustion gases and direct said gases on said first melting vessel in said furnace chamber;

d. at least one additional heat insulated chamber for receiving a metal mass to be heated;

e. an exhaust gas canal coupling said furnace chamber to said additional chamber, the input cross section of said additional chamber being larger than that of the exhaust gas canal; and

f. a single chimney connected only to said additional chamber, comprising:

g. forming the additional chamber into a melting chamber having an open cross section maintained at a size such that at least one second melting vessel may extend into it;

h. disposing a second melting vessel containing metals to be melted so as to extending into and be acted upon all sides by the exhaust gases in said melting chamber;

i. directing the hot combustion gases of the furnace chamber through said exhaust gas canal into said melting chamber;

j. allowing the hot combustion gases to expand in the melt-

ing chamber to transfer heat to the outer surfaces of the second melting vessel;

k. backing up the hot combustion gases in the melting chamber;

l. burning unburned fuel in said hot combustion gases which are exhausted to said melting chamber to generate additional heat to be transferred to said second melting vessel in the melting chamber; and

m. melting the metals in said second melting vessel with the heat from said hot exhaust gases and the heat generated by burning said unburned fuel.

4,466,828

PROCESS FOR SMELTING NICKEL

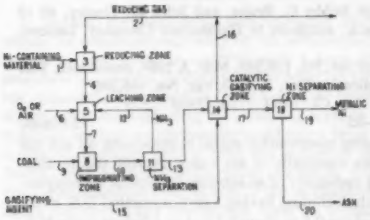
Yasukatsu Tamai; Taijiro Okabe, and Akira Tomita, all of Sendai, Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Continuation of Ser. No. 391,792, Jun. 23, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,499

Claims priority, application Japan, Jun. 26, 1981, 56-99239

Int. Cl.³ C22B *23/00*

U.S. Cl. 75—82 **10 Claims**



1. A process for refining nickel and gasifying coal, compromising:

(a) treating nickel-containing material with a reducing agent in order to reduce nickel compounds contained in said nickel-containing material and thereby produce metallic nickel;

(b) soaking the nickel-containing material treated in the step (a) in an ammoniacal aqueous ammonium salt solution and then treating said nickel-containing material in said ammoniacal aqueous ammonium salt solution with an oxygen-containing gas in the presence of free ammonia to produce an aqueous nickel ammine salt solution;

(c) treating coal with said aqueous nickel ammine salt solution to impregnate said coal with said nickel ammine salt and ammonia;

(d) removing the ammonia from said impregnated coal;

(e) gasifying catalytically said coal in the presence of a gasifying agent, thereby producing a reducing gas and a solid residue containing metallic nickel;

(f) recycling part of said reducing gas as the reducing agent in step (a); and

(g) recovering metallic nickel from said solid residue

4,466,829

TUNGSTEN CARBIDE-BASE HARD ALLOY FOR HOT-WORKING APPARATUS MEMBERS

Kenichi Nishigaki; Magoichi Takahashi, both of Omiya, and Keiichi Wakashima, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 364,644

Claims priority, application Japan, Apr. 6, 1981, 56-50528; May 15, 1981, 56-73030; Aug. 17, 1981, 56-128484; Aug. 17, 1981, 56-128485

Int. Cl.³ B22F *3/14*; C22C *29/00*

U.S. Cl. 75—240 **7 Claims**

1. A tungsten carbide-base hard alloy suitable for hot-working apparatus members, said alloy having a disperse phase and a binder phase and consisting of, by weight,

0.1–2% of Cr,

0.1–3% of Al,

5–30% of Ni,

2.5–15% of Co,

0–0.2% in total of one or both of B and Zr, and

0–2% in total of at least one of vanadium carbide, tantalum carbide and niobium carbide,

the remainder of said alloy being tungsten carbide and inevitable impurities, said Al content having been produced in situ in said alloy from AlN, said alloy having substantially no nitrogen remaining therein,

wherein the content of oxygen as an inevitable impurity is not more than 0.05%; said tungsten carbide forms said disperse phase of an average particle size of 2–8 μm; and said binder phase contains fine particles of precipitated γ′ phase of Ni_3Al structure.

2. An alloy according to claim 1, wherein the average particle size of the γ′ phase is 0.3 μm or less.

4,466,830

THICK FILM GOLD METALLIZATION COMPOSITION

Joseph R. Rellick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1982, Ser. No. 442,955

Int. Cl.³ H01B *1/02*

U.S. Cl. 106—1.18 **4 Claims**

1. Thick film gold composition suitable for electrical terminal contact metallization comprising:

65 to 97% by weight of gold particles,

3 to 25% by weight of particles of an alloy of cadmium and antimony having an antimony content of 25–80% by weight,

0–20% by weight copper particles and

0–30% by weight silver particles, the weights based on the total inorganic solids present, the solids being dispersed in a vehicle in a concentration sufficient to make a printable paste.

4,466,831

RAPIDLY DISSOLVABLE SILICATES AND METHODS OF USING THE SAME

Joseph R. Murphey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 265,821, May 21, 1981, Pat. No. 4,391,643. This application Sep. 27, 1982, Ser. No. 423,911

Int. Cl.³ C04B *19/04*

U.S. Cl. 106—74 **5 Claims**

1. A rapidly dissolvable partially hydrated powdered silicate comprising a mixture of sodium silicate and potassium silicate wherein:

the molar ratio of silicon dioxide to sodium oxide in the sodium silicate is in the range of from about 1.5:1 to about 3.3:1;

the molar ratio of silicon dioxide to potassium oxide in the potassium silicate is in the range of from about 1.5:1 to about 3.3:1; and

said powdered silicate has a water content in the range of from about 14% to about 16% by weight of hydrated silicate.

4,466,832

COMPOSITION FOR FORMING HYDROPHILIC COATING

Tatsushiro Yoshimura, Takatsuki; Takeaki Nakazima, Ibaraki, and Hiromasa Yokoi, Osaka, all of Japan, assignors to Daikin Kogyo Company, Limited, Osaka, Japan

Filed Sep. 29, 1982, Ser. No. 428,393

Claims priority, application Japan, Nov. 6, 1981, 56-178813

Int. Cl.³ C04B *49/04*

U.S. Cl. 106—74 **14 Claims**

1. A composition for forming hydrophilic coatings which comprise a mixture of:

(a) an alkali metal silicate having a SiO_2/M_2O mole ratio of 2 to 5 and a particle size of about 0.5 to about 2μ,
(b) a hydrophilic silicic acid or silicate in the form of fine particles of about 3 to about 30 mμ, and
(c) an ortho-acid ester of a transition element in Group IV of the Periodic Table or a derivative of the ester.

4,466,833

LIGHTWEIGHT CEMENT SLURRY AND METHOD OF USE

Lloyd B. Spangle, Claremore, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 373,472, Apr. 30, 1982, abandoned. This application Jul. 2, 1982, Ser. No. 394,597
Int. Cl.³ C04B 7/35; E21B 33/13
U.S. Cl. 106—88 30 Claims

1. A foamed hydraulic cement slurry comprising an aqueous slurry of hydraulic cement, an entrained gas in the form of multiple, discrete bubbles and a foaming agent represented by the formula

$$R(R'—)_3\,N^+X^-$$

wherein X is chloride, bromide, iodide or hydroxyl, R is an aliphatic, hydrocarbyl radical comprising from 8 to 16 carbon atoms and R' is, independently each occurrence, an alkyl radical of one to three carbon atoms or hydroxyethyl, and the sum of the carbon atoms in R and all R' is not greater than about 20.

4,466,834

CORROSION INHIBITING ADDITIVE FOR CEMENT COMPOSITIONS

Vance H. Dodson, Arlington, and Thomas D. Hayden, Winchester, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 3, 1983, Ser. No. 455,352
Int. Cl.³ C04B 7/35, 7/352
U.S. Cl. 106—89 12 Claims

1. As a composition, an aqueous solution which can be used as a corrosion inhibiting additive for Portland cement compositions, said solution consisting essentially of water and, as solutes, a major proportion by weight of calcium nitrite and a minor proportion by weight of corn syrup, a hydroxycarboxylic acid, or an alkali metal or alkaline earth metal salt of a hydroxycarboxylic acid.

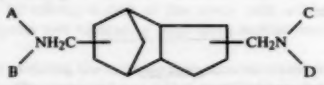
4,466,835

CEMENT COMPOSITIONS CONTAINING SET RETARDERS

Druce K. Crump, and David A. Wilson, both of Freeport, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 18, 1983, Ser. No. 486,123
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 14 Claims

1. In a process for retarding the setting of an aqueous cement slurry which comprises adding to said slurry an organic phosphonate, the improvement which comprises employing a compound of the formula



wherein A, B, C and D substituents are independently selected from hydrogen, $—CH_2PO_3H_2$, $—(CH_2)_nOH$ wherein n is 1 to 4, $CH_2CHOHSO_3H$, $CH_2CHOHCH_2SO_3H$, $—(CH_2)_nCOOH$ wherein n is 1 to 3 and the alkali metal, alkaline earth metal, ammonia and amine salts of the aforementioned phosphonic, sulfonic or carboxylic acids, providing that at least one of the above substituents is a methylenephosphonic acid group or the salt thereof.

4,466,836

SET RETARDING COMPOUNDS FOR USE IN CEMENT SLURRIES

Druce K. Crump, Lake Jackson, and David A. Wilson, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1983, Ser. No. 489,441
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 3 Claims

1. In a process for retarding the setting of an aqueous cement slurry which comprises adding to said slurry an organic phosphonate, the improvement which comprises employing a compound which is the phosphonomethylated reaction product of a dihalo or haloepoxy organic compound with aminoethylpiperazine wherein the mole ratio of dihalo or haloepoxy compound to the amine compound is from about 0.20 to about 1.0, and wherein at least 50% of the amine hydrogens are phosphonomethylated.

4,466,837

LIQUID WATER LOSS REDUCING ADDITIVES FOR CEMENT SLURRIES

Jiten Chatterji; Bobby G. Brake, and John M. Tinsley, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 126,595, Mar. 3, 1980, abandoned. This application Dec. 3, 1982, Ser. No. 446,305
Int. Cl.³ C08L 1/08; C04B 7/353
U.S. Cl. 106—85 15 Claims

1. A cementing composition useful in cementing oil and gas wells consisting essentially of sea water, cement and an additive consisting essentially of an aqueous solution of carboxymethylhydroxyethylcellulose having a carboxymethyl D.S. in the range of from about 0.1 to about 0.7 and an ethylene oxide M.S. in the range of from about 0.7 to about 2.5 and having a molecular weight such that a 5% by weight aqueous solution of said carboxymethylhydroxyethylcellulose at a temperature of 78° F. has a viscosity in the range of from about 75 to about 300 centipoises measured on a Brookfield viscometer at 60 rpm using a No. 4 spindle, a base selected from the group consisting of sodium hydroxide and potassium hydroxide, and an organic sulfonate dispersing agent.

4,466,838

PRESSURIZED CARRIER MIXTURE FOR AEROSOL PREPARATIONS

Dieter Heeb; Günter Bechmann; Uwe Bergemann; Volker Böllert, and Claus-Dieter Frenzel, all of Hamburg, Fed. Rep. of Germany, assignors to Hans Schwarzkopf GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 324,712, Nov. 24, 1981, abandoned, which is a continuation of Ser. No. 94,127, Nov. 14, 1979, abandoned. This application May 31, 1983, Ser. No. 498,033
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849590
Int. Cl.³ C08K 5/05, 5/06
U.S. Cl. 106—311 10 Claims

1. Pressurised carrier mixture for aerosol preparations of a self-propelling spray system, for use as a universal spray based on the active ingredients to be applied, organic solvents, water and propellants in a spray container, characterised in that the carrier mixture is present as a homogeneous solution consisting essentially of

70.0–50.1 percent by weight of water,
38.5–28.7 percent of weight of dimethyl ether,
0.5–10.0 percent by weight of iso-propanol and/or ethanol and/or n-propanol and
1.4–0.8 percent by weight of carbon dioxide wherein the percentage by weight data must add up to 100 percent by weight an in that the carrier mixture has a pressure of about 5 to about 7 bars at 20° C.

4,466,839

IMPLANTATION OF AN INSULATIVE LAYER

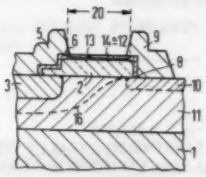
Joachim Dathe, and Walter Holtschmidt, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,594

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138960

Int. Cl.³ H01L 7/00

U.S. Cl. 148—1.5 23 Claims



1. Method for fabricating semiconductor components in which the semiconductor body of the semiconductor component is at least partially covered with a layer of inorganic insulation to generate an electrically conductive layer between two spaced metal contacts in contact with the insulating layer, which comprises subjecting the insulating layer to ion implantation to implant an electrically conductive layer within the inorganic insulation remote from the surface of the semiconductor body beneath the inorganic insulation, and extending the ion implantation over an area of the inorganic insulation to cause the electrically conductive layer to contact said two spaced metal contacts.

4,466,840

HYDROXYBENZYL AMINES AS CORROSION INHIBITORS AND PAINT ADHESION PROMOTERS

Dieter Frank, Naperville, and Lincoln D. Metcalfe, La Grange, both of Ill., assignors to Akzona Incorporated, Asheville, N.C.

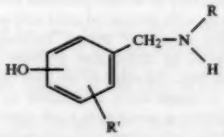
Division of Ser. No. 304,525, Sep. 21, 1981, Pat. No. 4,357,181.

This application Aug. 2, 1982, Ser. No. 404,260

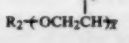
Int. Cl.³ C23F 11/14

U.S. Cl. 148—6.14 R 3 Claims

1. A method for inhibiting corrosion of a metal surface comprising contacting said metal surface with a corrosion inhibitor of the formula



wherein R is selected from the group consisting of aliphatic radicals containing from about 6 to about 22 carbon atoms, $R_1—C_mH_{2m}—$ wherein R_1 is alkoxy containing from 6 to 22 carbon atoms and m is an integer of from 2 to 6, and



wherein R_2 is alkyl containing from 1 to 20 carbon atoms, x is an integer of from 1 to 10 and each R_3 is independently hydrogen or methyl; and R' is selected from the group consisting of hydrogen, C_1–C_{12} alkyl, and C_1–C_{12} alkoxy, at a temperature and for a period of time sufficient to inhibit corrosion of said metal surface.

4,466,841

CATHODE ELECTRODE FOR AN ELECTRICAL DEVICE AND METHOD OF MAKING SAME

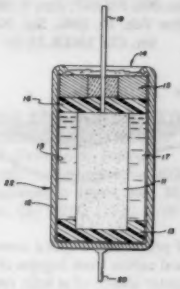
Charles W. Walters, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Division of Ser. No. 214,014, Dec. 8, 1980, Pat. No. 4,408,257.

This application Sep. 19, 1983, Ser. No. 533,414

Int. Cl.³ H01G 9/00

U.S. Cl. 148—6.14 R 4 Claims



1. A method of providing a cathode electrode for an electrolytic capacitor comprising the steps of providing a copper-based cathode electrode, chemically cleaning the cathode electrode, reacting a dilute solution of sodium-silver cyanide with said cathode electrode and then coating same with a finely divided electrically conductive material.

4,466,842

FERRITIC STEEL HAVING ULTRA-FINE GRAINS AND A METHOD FOR PRODUCING THE SAME

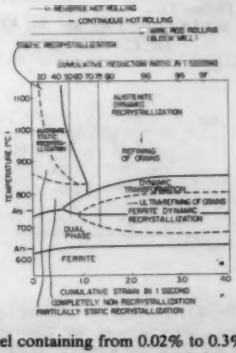
Hiroshi Yada; Yoshikazu Matsumura, and Koe Nakajima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 1, 1983, Ser. No. 481,453

Claims priority, application Japan, Apr. 3, 1982, 57-55649; Apr. 3, 1982, 57-55648; Jun. 17, 1982, 57-102991

Int. Cl.³ C21D 7/14

U.S. Cl. 148—12 R 6 Claims



1. A ferritic steel containing from 0.02% to 0.3% of carbon and from 0.1% to 2.0% of manganese, the balance being iron and unavoidable impurities, being essentially free of niobium, tantalum, molybdenum, and tungsten, being composed of 70% or more of ferrite at a hot-worked state, a ferrite structure consisting of equiaxed ferrite crystal grains having an average grain diameter of 4 μm or less, secondary phases other than ferrite phases being composed of at least one phase selected

from the group consisting of a pearlite, a martensite, a retained austenite, a carbide, and a bainite, and said ferrite crystal grains having essentially no orientation due to elongation thereof by working.

4,466,843

PROTECTION OF CABLE SPLICE

Gerald L. Shimirak, Pleasanton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 271,057, Jun. 8, 1981, abandoned. This application Feb. 10, 1984, Ser. No. 578,593

Int. Cl.³ H01B *13/06*

U.S. Cl. 156—48 **9 Claims**

1. A method of protecting a splice connecting at least two multi-wire electrical cables from ingress of water, each of said cables having an outer sheath of at least two layers of material and an inner core comprising a plurality of individual insulated wire conductors haaving interstices therebetween, which comprises:

(a) positioning a flexible reservoir about the splice, said reservoir comprising a polymeric material and having at least one opening therein and being sealed at each end thereof to the outer sheath of the cables adjacent said splice;

(b) introducing a curable liquid sealant into said reservoir through said opening and then closing said opening;

(c) compressing said reservoir at a pressure which forces said liquid sealant to penetrate into said splice and into the interstices between the conductors in the core of said cables adjacent said splice; and

(d) maintaining said reservoir under said pressure for a period of time sufficient to permit said liquid sealant to cure thereby forming a water impenetrable seal.

4,466,844

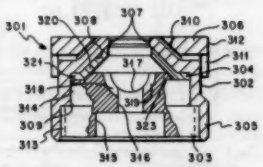
GRIPPER FOR CAPSULE WELDER

Donald N. MacLaughlin, Midland, Mich., and Vincent E. Fortuna, Huntington Beach, Calif., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Sep. 19, 1983, Ser. No. 533,092

Int. Cl.³ B29C *27/02*

U.S. Cl. 156—69 **11 Claims**



1. In a spinwelding system for welding together telescoped halves of rigid gelatin capsules, the improvement comprising:

a gripping and alignment assembly including an insert body having a central bore opening, an insert base insertable in said bore opening, and a flexible gripping diaphragm clamped between said body and said base and having a wall section adapted to move from a relaxed, non-gripping position to a gripping position on a capsule in said body, in response to a pressure differential across said diaphragm.

8. A method of gripping and aligning rigid gelatin capsules for performing spinwelding operations thereon, said method comprising:

locating a capsule vertically in an opening in a rigid housing assembly, said housing assembly having a flexible, pressure-responsive circular diaphragm therein;

applying a pressure differential to said diaphragm in a direction to flex said diaphragm inward against said capsule, thereby gripping and aligning said capsule in said housing; and,

relaxing said pressure differential after spin welding of said capsule has been performed.

4,466,845

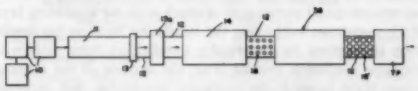
METHODS OF MAKING BI-AXIALLY ORIENTED, THIN-WALLED, SYNTHETIC PLASTIC CONTAINERS/ARTICLES

Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Sep. 24, 1980, Ser. No. 190,473

Int. Cl.³ B29C *27/08, 17/04;* B32B *1/10*

U.S. Cl. 156—73.5 **10 Claims**



1. In a method of forming thin-walled, hollow carbonated beverage and like containers from a thin-walled thermoplastic, synthetic plastic web material, the steps of:

a. forming a plurality of first preforms having neck portions and also open ended body portions with peripheral axial side walls in an incrementally advanced heated thermoplastic web of said material by differential pressure deformation of said material from the plane of the web into forming mold cavities having peripheral axially extending side walls at a temperature conducive to forming while applying squeezing pressure in each cavity to at least the side wall of the body portion of each first preform with a plug assist of the configuration of the cavity to forge the side wall material against the surface of the cavity and precondition it for subsequent stretching;

b. forming a plurality of second preforms having open ended body portions with peripheral axial side walls in a second incrementally advanced heated thermoplastic web of plastic material by differential pressure deformation of said material from the plane of the web into forming mold cavities at a temperature conducive to forming while applying squeezing pressure in each cavity to at least the side wall of the body portion of each second preform with a plug assist of the configuration of the cavity to forge the side wall material against the surface of the cavity and precondition it for subsequent stretching;

c. moving preforms from the mold cavities to enlarged orientation cavities of greater axial length and radial girth than the preforms and receiving them therein in a heated state at a temperature conducive to orientation and stretching the side walls of the body portions of the preforms radially and axially to biaxially orient them and expand them to the orientation cavity size;

d. trimming the expanded preforms from the webs; and

e. peripherally welding the open ends of the body portions of the trimmed first and second expanded preforms to form leak-proof products, each comprising a first and second expanded preform.

4,466,846

METHOD OF USING HEAT-RECOVERABLE ARTICLES TO PRODUCE A PRESSURIZABLE CASING AROUND A SUBSTRATE

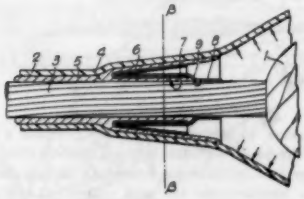
Jean-Marie E. Nolf, Hammenille, and Marc Verschelde, Waregem, both of Belgium, assignors to N.V. Raychem S.A., Kessel-lo, Belgium

Continuation of Ser. No. 259,802, May 4, 1981, abandoned, which is a division of Ser. No. 87,337, Oct. 23, 1979, abandoned. This application Aug. 12, 1982, Ser. No. 407,443

Claims priority, application United Kingdom, Oct. 27, 1978, 42194/78

Int. Cl.³ B29C *27/00*; B32B *31/04*

U.S. Cl. 156—85 9 Claims



1. A method for producing a pressurizable casing around an elongate substrate, comprising the steps of

wrapping a member about the substrate, wherein the member comprises flexible sheet material and has first and second surfaces which converge at a longitudinal edge of the member, and is positioned in use such that the longitudinal edge faces away from the area of the substrate to be encased, and the angle between the first and second surfaces can increase in response to pressure within said casing;

placing a heat recoverable sleeve over the area of the substrate to be encased and over the member;

effecting a bonding of the first surface of the member to the substrate;

effecting a bonding of the second surface of the member to the sleeve; and,

heat recovering the sleeve.

4,466,847

METHOD FOR THE CONTINUOUS PRODUCTION OF LAMINATES

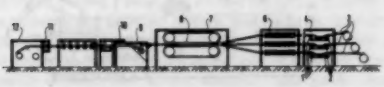
Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Continuation of Ser. No. 282,133, Jul. 10, 1981, abandoned, which is a continuation of Ser. No. 906,345, May 15, 1978, abandoned. This application May 6, 1983, Ser. No. 492,361

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722262

Int. Cl.³ B32B *31/08, 31/20*

U.S. Cl. 156—166 1 Claim



1. A method for continuously producing endless laminates from paper fiber layers consisting essentially of the sequence of

(a) employing an impregnator means for saturating fiber layers with hardenable heat-setting resins so that 50–70% resins relative to the drypaper weight are absorbed immediately followed by;

(b) drying said saturated fiber layers in a drying tunnel by means of highly heated ambient air, infrared or microwave radiations for minimum pre-condensation to reduce moisture content to 10–12% to result in a flexible soft paper fiber and then immediately followed by;

(c) passing said fiber layers through double-belt press laminating means for curing and further drying under surface pressure of 100 to 200 Newtons/cm² for a sufficient period of time depending on transport speed with said pressure being simultaneously applied over a substantially large area for a pre-determined time interval while applying heat to harden said impregnated fiber.

4,466,848

METHOD FOR MAKING COVERS

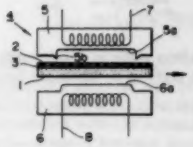
Naoki Ogawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 8, 1983, Ser. No. 502,209

Claims priority, application Japan, Jun. 10, 1982, 57-99556

Int. Cl.³ B29C *27/10, 3/00*

U.S. Cl. 156—242 14 Claims



1. A method of making a shaped plate to be used as a cover, comprising:

preparing a fibrous sheet of a fibrous composition comprising fiber material, synthetic resin and its cross linking agent,

preparing a sheet comprised of unvulcanized rubber,

preparing a thermoplastic resin film,

making a laminate comprising said fibrous sheet, said unvulcanized rubber sheet and said thermoplastic resin film placed between said fibrous sheet and said unvulcanized rubber sheet, by putting one upon another,

shaping said laminate by applying pressure and heat at such an elevated temperature as to cause the cross-linking reaction of said synthetic resin, the vulcanization of said unvulcanized rubber, and a change of said thermoplastic resin to a soft and adhesive condition, to take place simultaneously.

4,466,849

PROCESS FOR REMOVING ADHESIVE TAPE

Edward Dantsker, Hyattsville, Md., assignor to ERS Engineering Corporation, Royal Oak, Mich.

Filed Feb. 24, 1982, Ser. No. 351,909

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—248 11 Claims

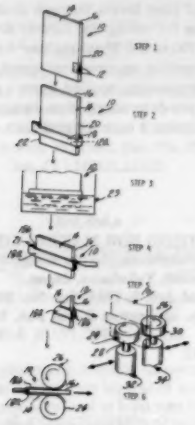
1. A process for removing lengths of pressure sensitive tape from opposite side surfaces of a body, wherein said tape lengths are joined by a joining portion extending about a leading surface of said body, comprising the steps of:

establishing localized leading areas of said tape lengths to be mildly adherent to said body;

severing said joining portion;

passing said body between a pair of opposing rollers, each carrying an adhesive band about the periphery thereof with said lengths of tape in registry with said adhesive

bands while urging said rollers into pressure contact therewith; and,



rotating said rollers while in engagement with said surfaces to cause said body to be advanced between said rollers.

4,466,850

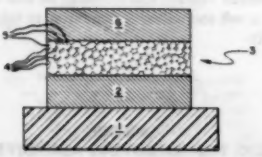
METHOD FOR FABRICATING A ONE-TIME ELECTRICALLY ACTIVATED SWITCH

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 220,343, Dec. 29, 1980, Pat. No. 4,380,749. This application Jan. 24, 1983, Ser. No. 460,326

Int. Cl.³ H01C *13/00*

U.S. Cl. 156—276 **10 Claims**



1. A method of fabricating a one-time electrically-activated switch, which comprises the steps of: admixing a curable polymeric binder and particles of a conductive material having an oxide surface thereon, said particles being present in an amount such that the oxide surfaces thereof are essentially in particle-to-particle contact after curing of the binder; applying the resultant admixture upon a first conductor over laying the admixture with a second conductor; and selecting the thickness of the applied admixture to be sufficient to cause said admixture, when cured, to resist the flow of electricity until a given threshold voltage of between about 8 and about 15 volts is applied thereto and to then form a conductive path between the first and second conductors; and curing said admixture.

4,466,851

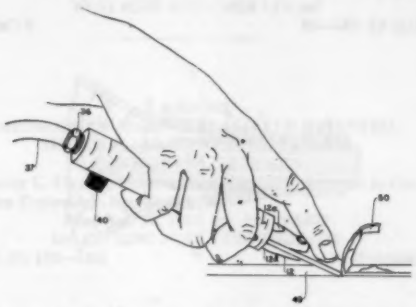
METHOD AND APPARATUS FOR SCRAPING ADHERENT MATERIAL FROM A SMOOTH WORK SURFACE

Brent K. Hoffman, Salt Lake County, Utah, assignor to Linear Pneumatics Inc., Salt Lake City, Utah

Continuation of Ser. No. 285,753, Jul. 22, 1981, abandoned, which is a division of Ser. No. 065,984, Aug. 13, 1979, abandoned. This application Feb. 16, 1983, Ser. No. 466,893

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—344 **11 Claims**



1. A method of scraping adherent material from a smooth work surface, comprising placing the working end of a chisel-like blade, having a blade edge extending transversely of the blade and defined by at least one beveled blade surface, with its said blade surface flat against said work surface; lightly tapping the opposite end of said blade by a hand-held pneumatic impact tool having an impact head rigidly secured to the tool body against movement relative thereto and operating at high frequency such as will free the adherent material without scratching or otherwise marring said work surface, said blade and said tool body being rigidly interconnected against relative movement to move in unison under the influence of said tapping impact; and pushing said impact tool and its said blade along said work surface while keeping said beveled blade surface flat thereaginst to separate said adherent material from said work surface at its interface, therewith.

4,466,852

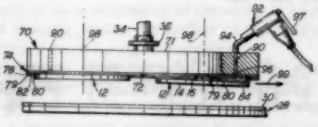
METHOD AND APPARATUS FOR DEMOUNTING WAFERS

Richard K. Beltz, Hamburg; Donald M. Large, Temple, and Daniel D. Leffel, Pottstown, all of Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,215

Int. Cl.³ B32B *31/16*

U.S. Cl. 156—344 **15 Claims**



1. A method of demounting a wafer from an adherent surface, comprising:

applying, via a passageway through the adherent surface, to and between the adherent surface and a mounting surface of the wafer, a fluid with sufficient pressure to dislodge the wafer; and

removing the dislodged wafer from the adherent surface.

4,466,853

MACHINE FOR THE MANUFACTURE OF MOLDED BODIES

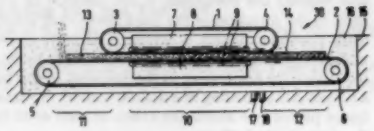
Werner Hartmann, Krefeld-Forstwald, Fed. Rep. of Germany, and Eduard Küsters, Gustav-Fünders-Weg 18, 14150 Krefeld, Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,055

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015518

Int. Cl.³ B32B *31/14*

U.S. Cl. 156—381 4 Claims



1. In a machine for the manufacture of molded bodies, in which finely divided material, mixed with a binder, is pressed, in a pressing zone, to achieve cohesion for forming the molded body while the binder sets, the improvement comprising a hood, having a closed top and sides and open on the bottom, for containing a gas which is at least largely low in oxygen and lighter than air, with at least the pressing zone of the machine enclosed by said hood and the gas therein.

4,466,854

METHOD AND DEVICE FOR PRODUCING A HELICALLY WOUND TUBE

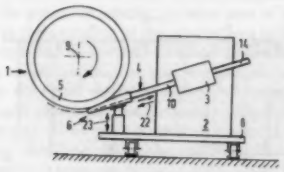
Manfred Hawerkamp, Altenrather Strasse, 47, 5210 Troisdorf, Fed. Rep. of Germany

Filed Nov. 9, 1982, Ser. No. 440,409

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145122

Int. Cl.³ B29C *19/00*; B65H *81/00*

U.S. Cl. 156—429 9 Claims



1. A device for producing a helically wound tube having a helical pitch angle, comprising a rotating mandrel around which the tube is formed, a profiled pressure applying member forming a calibrating guide channel disposed alongside said mandrel and having a receiving end for receiving a plastic strip and a delivery end oriented toward said mandrel, an extruder of a plastic strip oriented to direct a continuous extrusion strip to the receiving end of said guide channel for delivery through the guide channel and to the mandrel, said guide channel having walls forming the strip into a shape having two base flanges and a longitudinal portion, means for cooling said guide channel to cool the plastic strip delivered therethrough and means permitting relative movement of said mandrel and said extruder relative to the axis of said mandrel, said delivery end extending tangentially to said mandrel and at the pitch angle and having a surface facing said mandrel over which said flanges slide, said pressure applying member having a width at least equal to said strip.

4,466,855

LABEL DELAMINATING AND APPLYING DEVICE

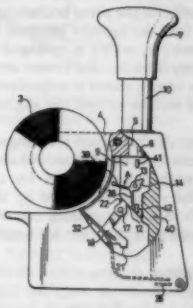
Tadao Kashiwaba, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Feb. 10, 1982, Ser. No. 347,590

Claims priority, application Japan, Feb. 17, 1981, 56-20115

Int. Cl.³ B44C *1/16*; B32B *31/00*; B31F *5/00*

U.S. Cl. 156—541 22 Claims



1. A label applying device comprising:

a main body; an actuator movable with respect to the body between an initial position and a label application position; an operator connected with the actuator for being operated to move the actuator between the positions thereof;

a label applier carried on the actuator and movable upon movement of the actuator to a position to contact a label to be applied; the label applier being movable in the application position of the actuator to press a label supported beneath the label applier against an article to be labeled;

a label feed mechanism for feeding labels to be applied beneath the label applier; the label feed mechanism being connected with the actuator for being operated to feed a label beneath the label applier upon movement of the actuator between the positions thereof;

a link mechanism pivotally connected to the actuator for pivoting with respect thereto as the actuator moves between the positions thereof; the label feed mechanism including a feed roller which is supported in the body for rotation to feed labels off a wound roll of labels on the feed roller; the link mechanism being connected with the feed roller for moving the feed roller to rotate as the actuator moves between the positions thereof;

the link mechanism includes a first arm pivotally connected to the actuator, a second arm pivotally connected to the first arm at a location spaced from the location where the first arm is connected to the actuator, a rocking member rotatably supported on the body and being connected to the second arm at a location spaced from the connection between the first and second arms, whereby the rocking member is rotated on the body under the influence of the link mechanism as the actuator moves to move the link mechanism; the rocking member being connected with the feed roller for rotating the feed roller as the rocking member rotates.

4,466,856

EQUIPMENT FOR THE MANUFACTURE OF A CONTINUOUS MULTI-LAYER VENEER BOARD

Matti Paakki, Lahti, Finland, assignor to Raute Oy, Lahti, Finland

Continuation-in-part of Ser. No. 392,071, Jun. 25, 1982,. This application Nov. 4, 1983, Ser. No. 549,643

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—558 1 Claim

1. Equipment for the manufacture of a continuous multi-

layer veneer board, which equipment consists of the following component devices coupled as an integrated whole:

a suction-lift type veneer dosage device for lifting the veneer sheets one sheet at a time from a stack of sheets and for shifting the sheet onto the first conveyor,

a first conveyor, which receives the sheets from the said dosage device,

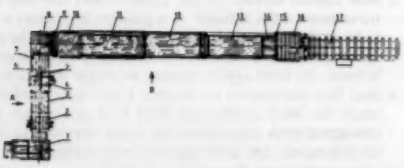
a veneer overturning device, which is arranged so as to receive the veneer sheets from the said first conveyor and to overturn every other veneer sheet received through 180° in relation to the plane containing the veneer track, as well as to feed the veneers received forwards,

a second conveyor, which is arranged so as to receive the veneer sheets from the said veneer overturning device and to align the veneer sheets in accordance with their track of running, as well as to feed the aligned veneer sheets forwards,

a scarfer-edger device, which is arranged so as to receive the veneer sheets from the said second conveyor and which is provided with cutting means for chamfering the side edges of the veneer sheets fed by the said second conveyor, with means for glueing one of the chamfered side edges, as well as with means for feeding the veneer sheets forwards,

a cutting aligning device, which is placed after the said scarfer-edger device in the direction of passage of the veneers and whose function is the aligning of the chamfered side edges of the veneer sheets fed by the said scarfer-edger device,

a third conveyor, which is arranged so as to receive the sheets fed by the scarfer-edger device through the aligning device,



a fourth conveyor, which is arranged so as to receive the veneer sheets from the said third conveyor, as well as as a crossing conveyor with the said third conveyor so that the track of movement of the veneer sheets is changed through 90° as the veneer sheet is shifted from the said third conveyor onto the said fourth conveyor,

a glueing device, which is arranged so as to receive the veneer sheets from the said fourth conveyor as well as to spread a glue solution onto the upper face of the veneer sheets,

a fifth conveyor, which is arranged so as to receive the veneer sheets fed by the said fourth conveyor through the glueing device and to feed the sheets further,

a sixth conveyor, which is arranged so as to receive the veneer sheets from the said fifth conveyor and to feed them further,

a seventh conveyor, which is arranged so as to receive the veneer sheets from the said sixth conveyor and to be movable in the direction of passage of the veneer track in relation to the said sixth conveyor so as to be moved at least partly to underneath the said sixth conveyor, as well as to feed the veneer sheets further,

an eighth conveyor, which is arranged so as to receive the veneer sheets from the said seventh conveyor and to be movable in the direction of passage of the veneer track in relation to the said seventh conveyor so as to be moved at partly to underneath the said seventh conveyor, as well as to feed the veneer sheets further as a unified mat consisting of successive sheets,

a ninth conveyor, which is arranged so as to receive the mat of veneer sheets from the said eighth conveyor as well as to position the sheets in relation to each other as well as in relation to the intended track of passage of the sheets, as well as to move in the direction of passage of the track together with the said eighth conveyor and to transfer the mat of veneer sheets further,

a positioning device for positioning the veneer sheets in the direction of the track, which positioning device is arranged so as to hold the veneer sheet mat fed by the said eighth conveyor and transferred by the said ninth conveyour, as well as so as to be shifted in the direction of passage of the track in relation to the said ninth conveyor so that in each sequence of veneer sheet mat consisting of successive veneers and produced by the said sixth, seventh, and eight conveyor, the joints between the successive veneers are positioned at the distance of a certain shift, in the direction of the track, from each other,

a tenth conveyor, which is arranged so as to receive the unified veneer mat consisting of successive sheets, from the device for positioning in the direction of the track, as a ranged pile consisting of a desired number of veneer may layers placed one above the other, as well as to transfer the ranged pile further,

a preliminary press, which is arranged so as to grasp the ranged pile of veneer mats placed on the said tenth conveyor by pressing and so as to shift the veneer mat range forwards during the pressing, as well as

a hot press, which is arranged so as to receive the veneer mat range from the said preliminary press and to induce an adhesion of the veneers together by means of heating and compression.

4,466,857

CONTINUOUSLY OPERATING PRESS FOR THE PRODUCTION OF PARTICLE BOARD, FIBERBOARD, PLYWOOD SHEETS OR THE LIKE

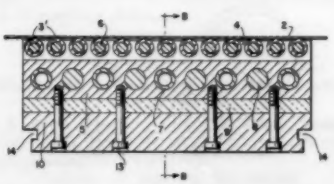
Heinrich Pfeiffer, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,315

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028145

Int. Cl.³ B30B *5/02*; B31F *5/00*; B23K *27/00*; B32B *31/00*

U.S. Cl. 156—583.5 **8 Claims**



1. A continuously operating press for the production of particle board, fiberboard, plywood or the like, comprising:

a press table;

a tup adjustably mounted with respect to said press table to define a press gap for receiving material to be pressed;

a first conveyor band disposed around said press table;

a second conveyor band disposed around said tup;

a roller bed support for supporting and guiding each of said first and second bands, respectively, said roller bed support comprising a plurality of change plates, each of said change plates containing heating apparatus, cooling apparatus, a plurality of rolls, and counter supports for said rolls, and being capable of being mounted to and removed from said table and said tup, each of said change plates further including a first rod mounted in a first level and connected in supporting relation with one of said rolls, at least one web plate connected to said first rod in said first level and to a connecting rod in a second level, and at least

one pressure plate connected to said connecting rod in said second level whereby counter pressure from said material being pressed is transferred to said pressure plate and connecting rod.

4,466,858

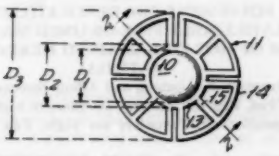
INTRAOCULAR AND EXTRAOCULAR LENS CONSTRUCTION AND METHOD OF MAKING THE SAME

Stanley Poler, New York, N.Y., assignor to Lynell Medical Technology Inc., New York, N.Y.

Division of Ser. No. 288,217, Jul. 29, 1981, Pat. No. 4,402,579. This application Nov. 12, 1982, Ser. No. 441,097

Int. Cl.³ B44C *1/22*; C03C *15/00*; C23C *1/00*; G03F *7/00*

U.S. Cl. 156—643 14 Claims



1. The method of making a unitary lens and haptic construction integrally formed from the same single sheet of transparent material, comprising a relatively thick rigid central lens component having a generally circular periphery, and a relatively thin pliant generally annular outer haptic component comprising plural leg formations radiating from the lens periphery at angular offset from each other; which method comprises selecting the sheet of transparent material of thickness at least sufficient to accommodate ultimate thickness of the lens component, masking one side of the sheet to permit selective removal of material in the generally annular included area of the haptic component to the exclusion of the central area of the lens component, masking the other side of the sheet to permit selective removal of material to define haptic leg formations within the generally annular included area of the haptic component to the exclusion of the central area of the lens component, subjecting both masked sides of the masked sheet to an eroding environment, the erosion exposure of said one side being to the depth extent of defining the relatively thin ultimate haptic thickness, and the erosion exposure of said other side being to the depth extent of at least said ultimate haptic thickness, removing the masks, and thereafter forming a lens curvature in at least one of the surfaces of the lens component.

3. The method of claim 1, wherein the transparent material is a plastic and said erosion exposure is by plasma ion discharge.

4,466,859

PROCESS FOR ETCHING COPPER

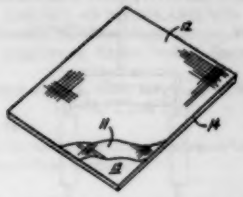
Norvell J. Nelson, Palo Alto, Calif., assignor to PSI Star, Inc., Hayward, Calif.

Continuation-in-part of Ser. No. 497,887, May 25, 1983, , which is a continuation-in-part of Ser. No. 450,685, Dec. 17, 1982,. This application Dec. 6, 1983, Ser. No. 558,626

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—646 5 Claims

1. In a process for etching copper on a substrate, the steps or protecting the copper where it is to be preserved with a film of organic resist material, covering the surface of the copper and the resist material with a hydrogel mixture of water and a polymer containing a surfactant, exposing the surface to an



oxidizing gas to dissolve the copper, and removing the mixture and the dissolved copper from the substrate.

4,466,860

METHOD FOR PRODUCING ETCHED PATTERNS ON TEXTILE FABRICS

Giordano Aggio, 163/1 Via S. Faustino, 41100 Modena, Italy

Filed Sep. 21, 1981, Ser. No. 304,257

Int. Cl.³ B44C *1/22*

U.S. Cl. 156—655 13 Claims

1. A method of chemically etching textile fabrics having a weave of cotton fibers and polyester or nylon fibers to produce etched patterns in the textile fabrics, comprising the steps of: (a) treating at least one exposed area of the textile fabric with a chemical composition which is reactive with the cotton fibers but not with the polyester or nylon fibers; (b) applying a predetermined amount of pressure and heat within a predetermind temperature range for a predetermined duration to the treated textile fabric to thereby cause the chemical composition to react with and eliminate the cotton fibers without reacting with the polyester or nylon fibers; and (c) washing the treated textile fabric to thereby remove the destroyed cotton and chemical composition, leaving the polyester or nylon fibers in tact to thereby produce said etched pattern.

4,466,861

PROCESS FOR THE INHIBITION OF THE FORMATION OF DEPOSITS IN CELLULOSE PULPING AND CELLULOSE PULP TREATING PROCESSES

Bengt G. Hultman, Domsjo, and Rolf C. Nilsson, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation of Ser. No. 164,660, Jun. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 902,321, May 3, 1978, Pat. No. 4,218,284. This application Oct. 14, 1981, Ser. No. 311,139

Claims priority, application Sweden, Jul. 25, 1977, 7708231

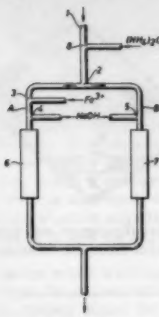
The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.

Int. Cl.³ D21C *11/00*

U.S. Cl. 162—38 9 Claims

1. A process for inhibiting the formation of deposits of cyclic cellulose pulping and cellulose pulp treating processes in which chemicals are recovered from spent liquor and recycled, thereby reducing or even eliminating the need for shutdown of equipment for cleaning, which comprises carrying out the cellulose pulping or cellulose pulp treating in a liquor having dissolved therein iron cation in an amount within the range from about 0.1 to about 0.5% by weight of the dry lignocellulosic material sufficient to form liquor-soluble complexes with deposit-forming anions and thus retain the deposit-forming anions in solution in the cellulose pulping or cellulose pulp

treating liquor, and inhibit the formation of deposits at every stage of the cyclic process in which such deposits may form,



including the chemicals recovery stage, by maintaining said iron cation within said range throughout the cyclic process.

4,466,862

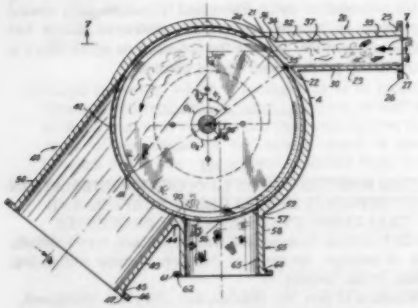
METHOD FOR SCREENING, SEPARATING, AND REMOVING FIBER BUNDLES, LUMPS, KNOTS AND FOREIGN MATTER FROM AQUEOUS DISPERSIONS USED IN FORMING NON-WOVEN FABRICS BY WET-LAYING

Michael Ring, Warwick, and Peter Angelini, Central Valley, both of N.Y., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 246,707, Mar. 23, 1981, abandoned. This application Feb. 17, 1983, Ser. No. 467,333

Int. Cl.³ D21C *5/18, 5/20*

U.S. Cl. 162—55 **3 Claims**



1. Method for screening, separating and removing fiber defects and foreign matter above a prescribed size from a dispersion of thin, long, flexible fibers having length to diameter ratios above 400 to 1, the dispersion intended for use in the formation of non-woven fabrics by wet-laying, the method comprising:

(a) producing a fiber dispersion stream of the thin, long, flexible fibers, the dispersion including a dispersion fluid, disoriented individual fibers, and lumped and tangled fibers;

(b) directing the stream over a substantially linear path to a curvilinear path at an entrance of an annular chamber having sidewalls, wherein the stream is introduced substantially tangential to the curvilinear path to avoid abrupt changes in stream direction and to avoid turbulence at the entrance;

(c) rotating the side walls to accelerate, throughout the cross-section in the direction of stream flow, the dispersion fluid relative to the disoriented fibers and lumped and tangled fibers to axially align and disperse the disoriented fibers in the stream;

(d) screening the lumped and tangled fibers above a prescribed size from the dispersion by presenting a lateral stream boundary to a screen comprising a plurality of tapered slots through which the disoriented fibers are aligned and accelerated to prevent passage of lumped and tangled fibers having a size above a prescribed value through the screen and permitting passage of other fibers through the screen; and

(e) washing accumulated lumped and tangled fibers prevented passage through the screen with the dispersion fluid and discharging the lumped and tangled fibers from the stream.

4,466,863

EQUIPMENT FOR DEVOLATILIZING DEVOLATILIZABLE FINE-GRAINED MATERIAL BY MEANS OF HOT FINE-GRAINED HEAT-CARRYING MATERIAL

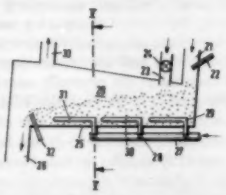
Roland Rammler, Königstein, and Alfons Bussmann, Nidderau, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 369,688, Apr. 19, 1982, abandoned, which is a continuation of Ser. No. 206,512, Nov. 13, 1980, abandoned. This application Jun. 13, 1983, Ser. No. 503,077

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946102

Int. Cl.³ C10B *1/08, 49/20, 57/02*

U.S. Cl. 202—99 **8 Claims**



1. An apparatus for devolatilizing hydrocarbon-containing fine-grained material selected from the group consisting of tar sand, oil shale, oil-containing diatomaceous earth and coal, comprising an agitating chamber with a bottom, at least one feed conduit for feeding said fine-grained material into said chamber, at least one inlet pipe for feeding fine-grained heated solids at a temperature of about 500° to 1000° C. into said chamber to form a mixture of solids therein, thereby heating said fine-grained material to temperatures of about 400° to 900° C. and devolatilizing it, said chamber having a withdrawing conduit for gases and vapors, said bottom having a discharge chute connected to a dwell zone for said mixture of solids, said bottom being horizontal or sloping slightly to the discharge chute, said agitating chamber being provided with a means for introducing agitating gas into said chamber to agitate said mixture of solids, the mixture of solids in the agitated state in said chamber caused by said agitating gas being moved towards said discharge chute and having a height of 0.1 to 1.0 meter, said introducing means comprising a manifold for feeding said agitating gas into the chamber disposed below the bottom of said chamber, branch conduits connected to said manifold, and nozzle conduits connected to said branch conduits, said nozzle conduits being parallel to and above said bottom, said nozzle conduits having nozzle openings obliquely directed toward said bottom.

4,466,864

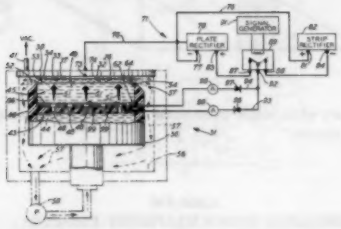
METHODS OF AND APPARATUS FOR ELECTROPLATING PRESELECTED SURFACE REGIONS OF ELECTRICAL ARTICLES

Duane E. Bacon, Lee's Summit, and Spencer S. Hecox, Raytown, both of Mo., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 561,862

Int. Cl.³ C25D *5/02, 7/12, 17/00*

U.S. Cl. 204—15 **16 Claims**



1. A method of electrolytically plating metal patterns to patterned anode surface windows of diode-coupled conductive regions beneath a passivating surface layer of an electrical article, which comprises:

coupling the article into an electrolytic treating circuit;

exposing the patterned windows to an electrolytic plating bath;

applying a series of alternating electrical plating and deplating pulses to the article; and

directing the plating pulses applied to the article through the electrolytic plating bath and a first electrode, and directing the deplating pulses through the electrolytic plating bath and a second electrode.

4,466,865

TRIVALENT CHROMIUM ELECTROPLATING PROCESS

Thaddeus W. Tomaszewski, Dearborn; Robert A. Tremmel, Woodhaven, and Larry T. Rudolph, Rochester, all of Mich., assignors to OMI International Corporation, Warren, Mich.

Filed Jan. 11, 1982, Ser. No. 338,751

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 **16 Claims**

1. A process for electrodepositing chromium on a conductive substrate from a trivalent chromium electrolyte in a manner to inhibit formation of detrimental hexavalent chromium ions in the electrolyte which comprises the steps of providing a bath composed of an aqueous acidic electrolyte containing trivalent chromium ions and a complexing agent, immersing an anode in said bath at least a portion of the surface of which is comprised of ferrite, immersing a substrate to be electroplated in said bath, anodically electrifying said anode and cathodically electrifying said substrate, passing current through said bath between said anode and said substrate to effect an electrodeposition of chromium on the substrate and continuing the passing of current until a chromium plating of the desired characteristics is deposited on the substrate.

4,466,866

ELECTROCHEMICAL PROCESS FOR THE PREPARATION OF SULPHOXIDES OF THIOFORMAMIDE DERIVATIVES, WHICH ARE USEFUL AS MEDICAMENTS

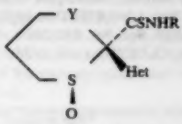
Jean Bizot, Morangis, and Dominique Deprez, Montlhery, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jun. 16, 1983, Ser. No. 504,788

Int. Cl.³ C25B *3/02*

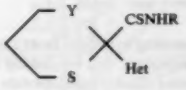
U.S. Cl. 204—78 **9 Claims**

1. A process for the preparation of sulphoxides of thioformamide derivatives of the formula:



(I)

wherein R represents a hydrogen atom or a straight- or branched-chain alkyl radical containing 1 to 4 carbon atoms, Het represents a heterocyclic radical of aromatic character containing one or two nitrogen atoms selected from pyridin-3-yl (OA substituted by a straight- or branched-chain alkyl radical containing 1 to 4 carbon atoms or by a halogen atom), quinolin-3-yl, pyridazin-4-yl, pyrimidin-5-yl, thiazol-5-yl, thieno[2,3-b]-pyridin-5-yl and thieno[3,2-b]pyridin-6-yl, and Y represents a valency bond or a methylene radical, which comprises oxidising the ring sulphur atom of a thioformamide derivative of the formula:



(II)

(wherein the symbols R, Het and Y are as hereinbefore defined) by an electrochemical method, the reaction being carried out in an electrolyte with a considerable water content, at a pH of between 7 and 7.5 and in the presence of a specific oxidising agent X^+ obtained in situ from a halide X^- by an electrochemical method, and at an imposed electrode potential similar to the oxidation potential of X^- and then isolating the product obtained.

4,466,867

PRODUCTION OF BLUE IRON HEXACYANOFERRATE-III PIGMENTS

Wolfgang Habermann, Mainz; Peter Hammes, Ruppertsberg; Joachim Felger, Walheim; Karl-Ludwig Hock, Ludwigshafen-Ruchheim; Friedrich Brunnmueller, Ludwigshafen; Helmut Knittel, Ludwigsburg; Joachim Kranz, Ludwigshafen; Rolf Schneider, Mannheim, and Peter Thoma, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,744

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206663

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—91 **19 Claims**

1. A process for the production of a blue iron hexacyanoferrate-III pigment, wherein iron-II hexacyanoferrate-II (Berlin white) is prepared, in an electrolysis cell whose anode chamber and cathode chamber are separated by an ion exchange membrane, by electrolysis of an aqueous solution containing (a) an iron-II salt, (b) an alkali metal salt, an ammonium salt or a mixture of these, and (c) hydrogen cyanide, at a pH of from 0.5 to 6, as catholyte in the cathode chamber, and of an electrically conductive, aqueous solution in the anode chamber, the iron-II

hexacyanoferrate-II is oxidized to the iron hexacyanoferrate-III pigment, and the latter is isolated.

4,466,868

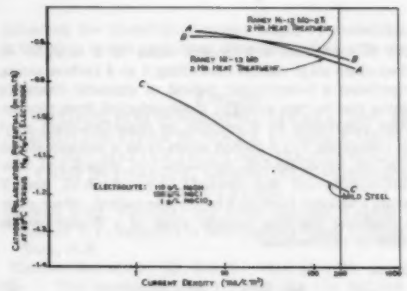
ELECTROLYTIC CELL WITH IMPROVED HYDROGEN EVOLUTION CATHODE

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 479,296, Mar. 28, 1983, Pat. No. 4,430,186, which is a division of Ser. No. 380,155, May 20, 1982, Pat. No. 4,425,203, which is a continuation-in-part of Ser. No. 301,681, Sep. 14, 1981, Pat. No. 4,374,712, which is a continuation-in-part of Ser. No. 080,745, Oct. 1, 1979, Pat. No. 4,289,650, which is a continuation-in-part of Ser. No. 025,153, Mar. 29, 1979, Pat. No. 4,240,895. This application Oct. 28, 1983, Ser. No. 546,240

Int. Cl.³ C25B *1/10, 1/26*

U.S. Cl. 204—95 15 Claims



1. A method of generating hydrogen from a hydrogen evolution cathode in an electrolytic cell by passing an electric current through an aqueous alkali metal chloride electrolyte between an anode and a hydrogen evolution cathode, said cell being adapted to produce an alkali metal chlorate product, said cathode being comprised of a monolithic structure having a surface formed from an integral precursory, adherent Raney Beta phase quaternary alloy represented by the formula Ni_x-$Mo_yTi_zAl_3$, where x is the weight percent of nickel, y is the weight percent of molybdenum and z is the weight percent of titanium, in the combined weight of nickel, molybdenum and titanium, and where x ranges from about 75 to about 94 percent by weight, y ranges from about 20 to about 5 percent by weight and z ranges from about 5 to about 1 percent by weight, and which has had from about 75 to about 95 percent of the aluminum leached from said surface with a strong aqueous base so as to form an active porous Raney Beta phase nickel-molybdenum-titanium surface layer whereby the hydrogen overvoltage of said surface is reduced.

4,466,869

PHOTOLYTIC PRODUCTION OF HYDROGEN

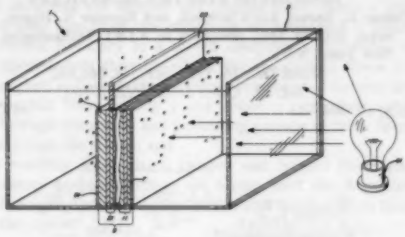
William Ayers, Princeton, N.J., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 15, 1983, Ser. No. 523,251

Int. Cl.³ B01J *19/12;* H01M *6/30*

U.S. Cl. 204—157.1 R 72 Claims

1. In a method of photolytic production of hydrogen in a photolytic device comprising maintaining an aqueous electrolyte in contact with an anode and a cathode, one of said anode and cathode being a photoelectrode, illuminating the photoelectrode, evolving hydrogen at the cathode and a co-product at the anode, the improvement wherein said photoelectrode comprises a substantially transparent, electrolyte resistance electrocatalytic layer, an electroconductive substrate, and a layered semiconductor photoelectrode element means between and in contact with the electrocatalytic layer and the electroconductive substrate, and wherein the anode and the



cathode are electrically connected to each other through an unbiased circuit.

4,466,870

ORGANIC SONOCHEMISTRY PROCESS

Philip R. Boudjouk, and Byung-Hee Han, both of Fargo, N. Dak., assignors to North Dakota State University Development Foundation, Fargo, N. Dak.

Filed Nov. 22, 1982, Ser. No. 443,577

Int. Cl.³ B01J *19/10*

U.S. Cl. 204—158 S 7 Claims

1. The method of reducing aryl halides involving nucleophilic substitution of hydrogen for halide on the aryl nucleus, comprising forming a mixture of aryl halide and lithium aluminum hydride in a liquid ether medium, and subjecting the mixture to ultrasonic energy.

4,466,871

METHOD FOR ELECTROPHORETIC ENAMELING

Friedel Kaup, Gutersloh, and Heinrich Warnke, Harsewinkel, both of Fed. Rep. of Germany, assignors to Miele & Cie. GmbH & Co., Gutersloh, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 382,583, May 27, 1982, abandoned. This application Nov. 1, 1983, Ser. No. 547,766

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121667

Int. Cl.³ C25D *13/02, 13/10*

U.S. Cl. 204—181 N 4 Claims

1. An electrophoretic coating method, comprising the steps of:

electrophoretically coating an anodic workpiece with enamel in an inorganic enamel slop composed of a watery suspension; and

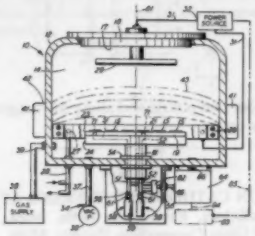
adding at least one substance to said enamel slop which is enamel compatible, and which emits electrons in the area of the anodic workpiece, said substance being selected from the group consisting of bromide or iodide.

4,466,872

METHODS OF AND APPARATUS FOR DEPOSITING A CONTINUOUS FILM OF MINIMUM THICKNESS

Itamar B. Einbinder, Overland Park, Kans., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,580
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 20 Claims



13. Apparatus for depositing a continuous film of material on a plurality of substrates, which comprises:

a first enclosure forming a process chamber;

means for supplying a source material to the process chamber;

means for supporting a plurality of first substrates within the process chamber;

at least one monitoring chamber including at least one communicating passage terminating in an opening within the process chamber;

means for depositing such source material on said substrates to form films thereon;

at least one second, gas-permeable substrate, said gas-permeable substrate covering said opening of each such at least one passage for supporting such formed films of material thereon;

means for diffusing a monitoring gas through the gas-permeable substrate; and

means for monitoring the diffusion of said monitoring gas through the second, gas-permeable substrate and for indicating when such diffusion through the second, gas-permeable substrate ceases, such cessation being indicative of a continuous film of said material having been deposited.

4,466,873

VACUUM DUAL CONTROL SYSTEM FOR THE FLAT BOX SECTION OF A PAPERMAKING MACHINE

Joseph A. Bolton, Queensbury, and Jeffrey B. Duncan, Argyle, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Continuation-in-part of Ser. No. 275,298, Jun. 19, 1981, abandoned. This application Mar. 9, 1983, Ser. No. 473,737
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ D21F 1/52, 11/02
U.S. Cl. 162—198 10 Claims

1. A vacuum dual control system for the flat box section of a papermaking machine comprising:

a plurality of serially arranged vacuum boxes;

a header interconnecting said boxes;

a vacuum pump operatively connected to said boxes in a manner so that the vacuum applied to the boxes is a function of the speed of the pump;

a first control means for operating the pump at an initial substantially constant high speed to produce the vacuum necessary to dewater a web in its initial condition;

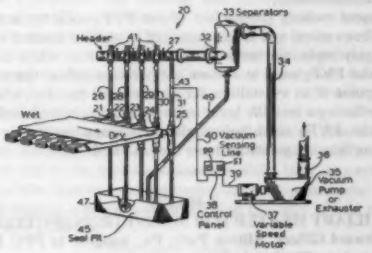
means for passing the web to be dewatered over the boxes so that suction applied therethrough by the pump running at its initial substantially constant high speed dewaters the web until the condition of the web changes sufficiently to cause the vacuum in the last box to increase to a predetermined maximum level;

a second control means having set point adjustment means thereon to enable selection of a predetermined set point corresponding to the predetermined maximum vacuum level, said second control means being connected to the last box and the vacuum pump and including sensing means to sense the predetermined maximum vacuum level as determined by the second control means predetermined maximum vacuum level as determined by the second control means predetermined set point and only operable in place of said first control means; and

means for terminating operation of said first control means and initiating operation of said second control means in response to the sensing means sensing the vacuum level reaching the maximum vacuum level as determined by the second control means set point to correspondingly lower the speed of the vacuum pump and maintain the maximum vacuum level.

6. A method of controlling vacuum conditions in the flat box section of a papermaking machine by use of a dual control system comprising:

operatively interconnecting a plurality of serially arranged vacuum boxes with a header and a vacuum pump in a



manner so that the vacuum applied to the boxes is a function of the speed of the pump;

operating the vacuum pump by a first controller to run the pump at an initial substantially constant high speed and produce the vacuum necessary to dewater a web in its initial condition;

passing the web to be dewatered over the boxes so that suction applied therethrough by the pump at its initial substantially constant high speed dewaters the web until the condition of the web changes sufficiently to cause the vacuum in the last box to increase to a predetermined maximum level; and

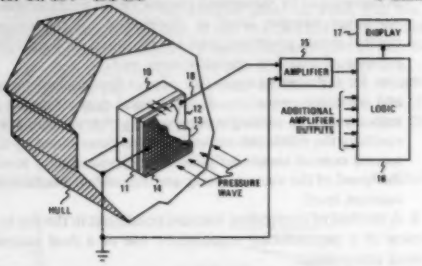
lowering the speed of the vacuum pump to maintain the maximum vacuum level by use of the second controller having a set point adjustment to enable selection of a predetermined set point corresponding to the predetermined maximum vacuum level, the second controller being connected to the last box and the vacuum pump and including a sensor to sense the vacuum level as determined by the second controller set point and only operable in place of said first controller by terminating operation of said flat controller and initiating operation of said second controller in response to the sensor sensing the vacuum level reaching the maximum level as determined by the second controller set point.

4,466,874

METHOD OF ELECTRODING A POLY(VINYLIDENE FLUORIDE) SOLID

Robert E. Belke, Jr.; Richard J. Hill; Raymond A. Shirk, all of N. Syracuse, and David P. Smith, Clay, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,060
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 EC 8 Claims



1. The method of electroding a poly(vinylidene fluoride) (PVF_2) solid comprising the steps of:

providing a PVF_2 solid containing crystallites,

abrading the surface of the PVF_2 solid to provide an irregular surface,

rinsing the surface of the PVF_2 solid to remove surface contaminants,

plasma etching the surface of the PVF_2 solid by activated free radical and ionic species of oxygen to created temporary molecular scale surface irregularities while keeping the PVF_2 solid at a room temperature below the melting point of its crystallites for dimensional stability, and

sputtering a metallic layer upon the plasma etched surface of the PVF_2 solid before the temperary molecular scale surface irregularities have deteriorated.

4,466,875

AUXILIARY HEATER FOR MAGNETRON SPUTTERING

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 30, 1983, Ser. No. 556,656
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 13 Claims

1. In a method for coating a large substrate by sputtering a scanning cathode wherein the substrate is heated, the improvement which comprises employing radiant heating means in scanning mode to heat the top surface to be coated prior to cathode sputtering.

4,466,876

THIN LAYER DEPOSITING APPARATUS

Takamasa Sakai, and Yasuhiko Sato, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,720
Claims priority, application Japan, Mar. 17, 1981, 56-36419[U]; Aug. 17, 1981, 56-121643[U]
Int. Cl.³ C23C 15/00
U.S. Cl. 204—298 14 Claims

1. A thin layer depositing apparatus which comprises:

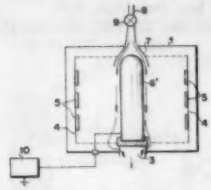
a reaction vessel;

substrates supported within said reaction vessel;

a gas accelerating nozzle provided within said reaction vessel;

a gas supply means for supplying reactive gas to said reaction vessel through said nozzle; and

a thin layer depositing means for depositing a thin layer on said substrate, said thin layer depositing means comprising a target positioned within said reaction vessel and a sputtering means for sputtering said target, and wherein said target has a cylindrical configuration and said substrates so positioned to surround the target allowing reactive gas



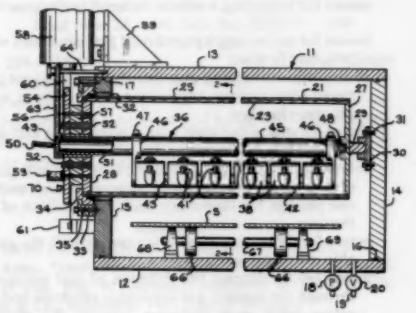
to flow from said nozzle and along the longitudinal direction of the target.

4,466,877

MAGNETRON CATHODE SPUTTERING APPARATUS

Harold E. McKelvey, Farmington Hills, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Oct. 11, 1983, Ser. No. 540,363
Int. Cl.³ C23C 15/00
U.S. Cl. 204—298 14 Claims



1. Magnetron cathode sputtering apparatus, comprising a pair of elongated rotatable sputtering targets mounted in horizontally spaced parallel relation in an evacuable coating chamber for sputter-coating substrates also located in said chamber beneath said targets, and separate magnetic means located in said targets, said magnetic means being disposed at an angle to one another to focus the material sputtered from said targets upon said substrates.

4,466,878

ELECTROCHEMICAL ELECTRODE ASSEMBLY

Robert G. DiNitto, Acton; John C. Harris, Andover, and Robert F. Maciel, Tyngsboro, all of Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Jan. 12, 1983, Ser. No. 457,509
Int. Cl.³ G01N 27/54
U.S. Cl. 204—415 20 Claims

1. A replaceable cartridge assembly for use with electrochemical analysis apparatus comprising

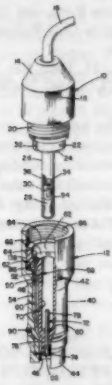
housing structure of electrically insulating material that defines an annular electrolyte chamber, coupling structure at one end of said housing structure, an electrolyte chamber port at the other end of said housing structure,

a selectively permeable membrane extending across said port in sealing relation thereto,

an elongated cavity within said housing structure that has an open port adjacent said coupling structure through which the projecting stem of a cooperating connector component is adapted to be inserted, said cavity being bounded

by an end wall remote from said coupling structure and by side wall structure of electrically insulating material extending between said port and said end wall that defines the inner wall of said annular electrolyte chamber,

a cathode electrode extending through said cavity end wall with a cathode electrode contact surface exposed at the base of said cavity for engagement with an electrical contact member carried at the end of said projecting stem, said cathode electrode having a tip at its end opposite said cathode electrode contact surface in juxtaposed relation to said membrane,



an anode electrode extending through a wall of said housing with an anode electrode contact surface exposed adjacent said coupling structure and a major portion of said anode electrode disposed in said electrolyte chamber, and

electrolyte in said annular chamber such that said electrolyte is disposed annularly around said cathode electrode and extends through said port into the region between said membrane and the tip of said cathode electrode to provide an electrically conductive path between said anode and cathode electrodes.

4,466,879

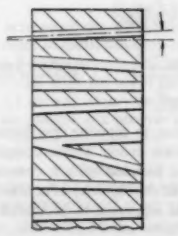
POLAROGRAPHIC OXYGEN SENSOR

Nelson Ho, Murray; Bryan Thompson, and Jiri Kratochvil, both of Sandy, all of Utah, assignors to Critikon, Inc., Tampa, Fla.

Continuation of Ser. No. 262,091, May 11, 1981, abandoned. This application Apr. 8, 1983, Ser. No. 483,336

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—415 **6 Claims**



1. A polarographic sensor for monitoring or measuring partial pressure of blood oxygen comprising:

respective anode and cathode electrode elements carried fixedly on a given surface;

an ultrafiltration membrane directly overlying and contacting said surface and said electrode elements, said membrane defining substantially cylindrical pores having diameters of less than 12 micrometers; and

means for passing blood over the side of said membrane not in contact with said surface.

4,466,880

OXYGEN SENSOR

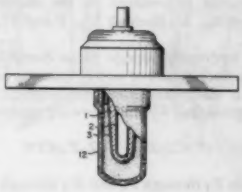
Hideo Torii, Higashiosaka; Hideyuki Okinaka, Settsu, and Toshio Ozawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 17, 1982, Ser. No. 419,497

Claims priority, application Japan, Sep. 17, 1981, 56-147621

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—428 **5 Claims**



1. An oxygen gas sensor for use in a high temperature gas flowing at a high speed and for sensing an oxygen concentration in the gas, said sensor comprising: an oxygen gas sensing element comprising a sensing body and an electrode; and a hollow cylindrical cap housing said sensing element in the hollow thereof in a manner that said sensing element is spaced from the inner surface of said cylindrical cap so as to expose said electrode in said hollow, said cylindrical cap being self supporting and being formed of a sintered metal wool forming a metal wool web complex porous to said gas, with innumerable small meandering gas paths being formed in said metal wool web complex, whereby said cylindrical cap functions to weaken mechanical shock and thermal shock to said sensing element due to the high flow pressure of the high temperature gas, and also functions to determine the sensing response time of said sensing element with a selected porosity of said metal wool web complex.

4,466,881

PROCESS FOR THE PREPARATION OF (ω-FLUOROSULFONYL)HALOALIPHATIC CARBOXYLIC ACID FLUORIDES

Masato Hamada; Jukichi Ohmura, both of Yokohama, and Fumio Muranaka, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 360,676, Mar. 22, 1982, Pat. No. 4,425,199. This application May 12, 1983, Ser. No. 493,946

Claims priority, application Japan, Apr. 2, 1981, 56-48383

Int. Cl.³ C25C *1/00, 3/00*

U.S. Cl. 204—59 F **4 Claims**

1. A process for the continuous preparation of a (ω-fluorosulfonyl)haloaliphatic carboxylic acid fluoride which comprises subjecting to electrolysis an electrolyte comprising at least one compound selected from the group consisting of compounds represented by the following general formulas:

$$\mathrm{YS(CX_1X'_1CX_2X'_2\ldots CX_nX'_n)COY'}, \quad (1)$$

$$\mathrm{Y''S(CX_1X'_1CX_2X'_2\ldots CX_nX'_n)CH_2OH} \quad (2)$$

and

-continued

$$[YS(CX_1X'_1CX_2X'_2 \ldots CX_nX'_n)CO]_2O \quad (3)$$

wherein n is an integer of from 1 to 4, X_1 through X_n and X'_1 through X'_n each independently is H, Cl or F, Y is an alkyl group having 1 to 8 carbon atoms, OH, Cl, F or OR in which R stands for an alkyl group having 1 to 8 carbon atoms, Y' is Cl, F, OH or OR' in which R' is an alkyl group having 1 to 8 carbon atoms, and Y'' is Y or OM in which M is an alkali metal, provided that in the case of the compounds represented by the above formula (1), X_1 through X_n, X'_1 through X'_n, Y and Y' are not F concurrently,

and liquid hydrogen fluoride in an electrolytic cell to effect electrolytic fluorination of said at least one compound, thereby obtaining a (ω-fluorosulfonyl)haloaliphatic carboxylic acid fluoride represented by the following general formula:

$$FSO_2(CZ_1Z'_1CZ_2Z'_2 \ldots CZ_nZ'_n)COF$$

wherein Z_1 through Z_n and Z'_1 through Z'_n each independently is F or Cl, and n is as defined above,

said electrolysis being conducted while keeping said electrolyte at a composition obtained at the time the current flows at an electricity quantity of 40% to 110% based on the theoretical electricity quantity.

4,466,882

SIMULTANEOUS BENEFICIATION AND TREATMENT OF OIL SHALE

Costandi A. Audeh, Princeton, N.J.; Joseph J. Dickert, Jr., Yardley, and Patrick E. Fowles, Doylestown, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,903

Int. Cl.³ C10G *1/00*; C10B *53/06*

U.S. Cl. 208—11 R **14 Claims**

1. A beneficiation process for oil shale ore which additionally contains pyrites wherein the ore is simultaneously treated to substantially reduce hydrogen sulfide formation during subsequent retorting, comprising the steps of:

(a) subjecting the oil shale ore to an aqueous medium which additionally contains hydrogen peroxide as a mild oxidant;

(b) bubbling gas through the aqueous medium to agitate the oil shale ore, separate higher grade shale ore by flotation, and oxidize at least part of the pyrites present in the oil shale ore; and

(c) collecting the floated oil shale ore and retorting to produce hydrocarbon fluids, gases, or mixtures thereof wherein the hydrocarbon sulfide formation is substantially less than that compared to directly retorting said oil shale ore.

4,466,883

NEEDLE COKE PROCESS AND PRODUCT

Daniel B. Eickemeyer, Crete; Maurice K. Rausch, Homewood, and Gerald E. Tollefsen, Calumet City, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jun. 27, 1983, Ser. No. 508,378

Int. Cl.³ C10B *55/00*

U.S. Cl. 208—50 **13 Claims**

1. In a process for the production of highly crystalline petroleum coke from a petroleum feedstock, wherein the petroleum feedstock is successively subjected to heat soaking in the presence of from about 20 to about 200 parts per million of added dissolved sulfur, thermal cracking, flashing to separate pitch as a residue from the pitch-free overhead stream, separating a heavy cokable residue from the pitch-free overhead stream, and subjecting the heavy cokable residue to delayed coking, the improvement wherein there is utilized as petroleum feedstock a blend comprising from about 30 to about 60 weight percent of a pyrolysis furnace oil and from about 40 to about 70 weight percent of a hydrotreated mixture comprising from about 30 to 70 volume percent of clarified catalytically cracked oil and from about 30 to 70 volume percent solvent refined lubricating oil extract.

4,466,884

PROCESS FOR CRACKING HIGH METALS CONTENT FEEDSTOCKS USING A CRACKING CATALYST MIXTURE CONTAINING ANTIMONY AND/OR TIN

Mario L. Occelli, Allison Park, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 27, 1982, Ser. No. 453,290

Int. Cl.³ C10G *29/04, 11/05*

U.S. Cl. 208—120 **22 Claims**

1. A process for the catalytic cracking of a high metals content charge stock which comprises contacting said charge stock under catalytic cracking conditions with a catalyst composition comprising a cracking catalyst having high activity and, as a separate and distinct entity, a diluent of little cracking activity having a MAT Activity below about 1.0 selected from the group consisting of magnesium-containing clay minerals and containing at least one metal selected from the group consisting of antimony and tin.

4,466,885

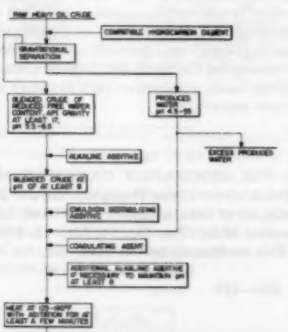
METHOD FOR REMOVING SOLIDS AND WATER FROM PETROLEUM CRUDES

Clifford P. Rorden, Edmonton, Canada, assignor to Husky Oil Operations Ltd., Calgary, Canada

Filed Jul. 13, 1982, Ser. No. 397,934

Int. Cl.³ C10G *33/04*

U.S. Cl. 208—188 **15 Claims**



1. In the reduction to pipeline specifications of the BS&W content of petroleum crude which comprises a water-in-oil emulsion, has been blended with a compatible hydrocarbon diluent to provide an API gravity of at least 17 and from which free water has been separated as produced water, the method comprising

treating the dewatered blended crude to destabilize the water-in-oil emulsion;

providing in uniform distribution throughout the dewatered blended crude

an amount of produced water equal to at least 1% of the volume of the dewatered blended crude, and

a small proportion of at least one acid-reacting coagulating agent,

while maintaining the pH of the dewatered blended crude at at least 8;

maintaining the resulting treated crude at 52°–88° C. (125°–190° F.) for at least a few minutes;

then separating the treated crude into at least an oil phase and a water phase; and

recovering the oil phase as a clean blended crude oil having a BS&W content within pipeline specifications and in a yield significantly in excess of that which can be recovered without use of produced water and coagulating agent.

2. The method according to claim 1, wherein

the step of treating the dewatered blended crude to destabilize the emulsion is accomplished by

adding an alkalyzing agent to the dewatered blended crude in an amount adequate to bring the pH of the dewatered crude to at least 8, and

adding to the dewatered blended crude an emulsion destabilizing agent which is acidic; and

the method further comprises

adding to the treated crude at a time not substantially earlier than the addition of the coagulating agent an additional quantity of an alkalyzing agent adequate to reestablish a pH of at least 8 when the coagulating agent is present in the treated crude.

4,466,886

FROTH FLOTATION METHOD FOR RECOVERING MINERALS

Vojislav Petrovich, 1935 W. Schiller St., Chicago, Ill. 60622

Filed Sep. 28, 1982, Ser. No. 425,440

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **6 Claims**

1. In concentrating by froth flotation of nickel, ores, which includes the subjecting of said material when finely ground to froth flotation process in the presence of pyridil ketoxime cyclohexanol promoter-collector; the step of adding to the ammoniacal mineral slurry of the pH 8 an amount of the order from 0.05 to 0.5 kg per ton of ore treated of pyridil ketoxime cyclohexanol; said addition to aqueous dispersion of ore produce a froth floating product of nickel mineral value by continuing agitation and aeration of the aqueous dispersion of ore, and separating and recovering the nickel mineral as float froth concentrate product.

4,466,887

POLYMER COLLECTORS FOR COAL FLOTATION

Anthony E. Gross, Clarendon Hills, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 11, 1983, Ser. No. 512,253

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **3 Claims**

1. A method of increasing the yield of coal undergoing a concentration treatment of froth flotation by using as the collector an alkyl phenol formaldehyde condensate product having 4–15 phenolic nuclei with the alkyl group of said phenol having between 4–15 carbon atoms in the froth flotation to separate coal from the gangue and recover coal with the froth.

4,466,888

SUCTION LIQUID COLLECTION ASSEMBLY AND FLEXIBLE COLLECTING BAG THEREFOR

Wesley H. Verkaart, Duxbury, Mass., assignor to Haemonetics Corporation, Braintree, Mass.

Continuation-in-part of Ser. No. 151,674, May 20, 1980, abandoned. This application May 21, 1981, Ser. No. 266,065

Int. Cl.³ B01D *35/02*

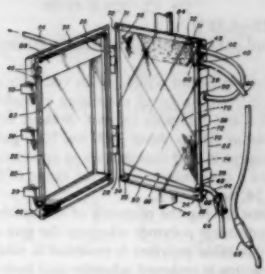
U.S. Cl. 210—232 **19 Claims**

10. A flexible liquid collection bag suitable for use in a suction blood collection system comprising:

a bag membrane forming front and rear bag faces joined alongside, top and bottom peripheral edges such that the membrane may be clamped between rigid pressure shell components;

fluid inlet and air outlet ports formed near the top of the bag, each through an edge thereof, and a drain port formed near the bottom of the bag through an edge thereof;

a filter element within the bag which divides the bag into inlet and outlet chambers, the filter element lying substantially flat between front and rear faces of the bag when the bag is collapsed, the fluid inlet port passing into the inlet chamber near the top thereof, the air outlet port passing from the outlet chamber near the top thereof and the drain port passing from the outlet chamber near the bottom thereof; and



a vent hole through the bag membrane for equalizing pressure applied to the bag faces.

4,466,889

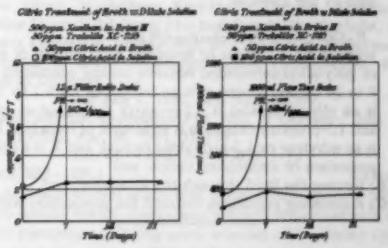
POLYVALENT METAL ION CHELATING AGENTS FOR XANTHAN SOLUTIONS

James W. Miller, Mystic, and Bryce E. Tate, Niantic, both of Conn., assignors to Pfizer Inc.

Filed Aug. 20, 1981, Ser. No. 294,593

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—8.55 D **6 Claims**



1. A process for producing a stable xanthan solution with superior filterability and subterranean injectivity characteristics comprising admixing a fermentation broth, or a diluted form thereof, containing cells of an organism belonging to the genus Xanthomonas and at least about 100 ppm xanthan biopolymer with a chelating agent selected from:

A. aliphatic alpha-hydroxy acids or salts thereof having from about 2–7 carbon atoms;

B. aliphatic and aromatic beta-keto acids or salts thereof or beta-diketones having from about 4–9 carbon atoms; or

C. 2- and 4-pyrones having a hydroxyl group alpha to the carbonyl and having 5 or 6 carbon atoms; said chelating agent being added in an amount of at least about 1.0 ppm of the total solution.

4,466,890

LIQUID GEL CONCENTRATES AND METHODS OF USING THE SAME

James E. Briscoe, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 57,099, Jul. 12, 1979, Pat. No. 4,336,145. This application Dec. 16, 1981, Ser. No. 331,260
The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.
Int. Cl.³ E21B *43/26*
U.S. Cl. 252—8.55 R 3 Claims

1. A liquid gel concentrate consisting essentially of:
water;
a hydratable polymer which yields viscosity upon hydration selected from the group consisting of hydratable polysaccharides and mixtures thereof, present in an amount of from about 500 to about 3000 lbs/1000 gals. of water;
a base present in said concentrate in an amount sufficient to produce a concentrate pH in the range of from about 9 to about 14; and
an inhibitor having the property of reversibly reacting with said hydratable polymer whereby the rate of hydration of said hydratable polymer is retarded at said pH range and said reaction is reversed whereby said hydratable polymer is hydrated at a lower pH range, said inhibitor being selected from the group consisting of compounds capable of releasing antimony, titanium, iron, zinc or aluminum ions in an aqueous medium, silicates, aldehydes, sodium sulfite, and mixtures of such compounds.

4,466,891

GLYCERYL ETHER SULFONATES FOR USE IN OIL RECOVERY FLUIDS AND PROCESSES

David R. McCoy, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,584
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D 16 Claims

1. A process for recovering petroleum from a subterranean, petroleum-containing formation penetrated by an injection well and a production well which comprises:
(A) injecting into the formation via the injection well an aqueous fluid comprising water having dissolved therein an effective amount of a surface active agent characterized by the formula:

$$R_1(OCH_2CH(OH)CH_2)_m(R_2)_nOR_3SO_3X$$

wherein R_1 is a linear or branched alkyl radical or mono- or poly-alkyl substituted benzene radical containing from 8 to 24 carbon atoms; m is an integer of from 1 to 10; R_2 is an ethoxy radical, a 1,2-propoxy radical or an ethoxy and 1,2-propoxy radical; n is an integer of from 0 to 10; R_3 is an ethylene or 1,3-propylene radical; and X is a sodium, potassium or ammonium cation; and
(B) forcing the fluid through the formation; and
(C) recovering petroleum through the production well.

4,466,892

CAUSTIC FLOODING WITH STABILIZED WATER FOR ENHANCED OIL RECOVERY

Keng S. Chan, South Euclid, and Stephen J. Majoros, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 28, 1982, Ser. No. 343,660
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D 7 Claims

1. A process for producing petroleum from oil-bearing reservoirs by driving a fluid from at least one injection well to a producing well, the process comprising injecting via the injection well a blend of injection water containing divalent metal ions, lignosulfonate in an amount sufficient to prevent significant precipitation of insoluble compounds, and an alkaline material selected from the group consisting of sodium hydroxide, sodium carbonate, trisodium phosphate, and ammonia, provided that the lignosulfonate is mixed with the injection water before the addition of the alkaline material.

4,466,893

METHOD OF PREPARING AND USING AND COMPOSITION FOR ACIDIZING SUBTERRANEAN FORMATIONS

Walter R. Dill, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 225,177, Jan. 15, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,389
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C 19 Claims

1. A gelled acidizing composition comprising:
a. an acid selected from the group consisting of hydrochloric acid, hydrofluoric acid, acetic acid and formic acid and mixtures thereof;
b. a gelling agent selected from the group consisting of gum karaya, gum tragacanth, gum ghatti, gum acacia, gum konjak, shariz, locus, psyllium, tamarind, gum tara, carrageenin, gum kauri, hydroxypropyl guar, hydroxyethyl guar, carboxymethyl hydroxypropyl guar and carboxymethyl hydroxyethyl guar, said gelling agent present in an amount sufficient to gel said acid; and
c. urea in an amount sufficient to extend the viscous stability of said composition in comparison to the viscous stability of a gelled acid comprising said selected acid and said selected gelling agent alone.

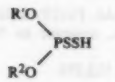
4,466,894

PHOSPHORUS-CONTAINING METAL SALTS/SULFURIZED PHENATE COMPOSITIONS/AROMATIC SUBSTITUTED TRIAZOLES, CONCENTRATES, AND FUNCTIONAL FLUIDS CONTAINING SAME

Kent B. Grover, Chardon, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 20, 1983, Ser. No. 486,640
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E 33 Claims

1. A composition comprising
A. at least one metal salt of a mixture of acids comprising
(A)(I) at least one acid of Formula I



I

wherein R' and R^2 are the same or different and each of R' and R^2 is a hydrocarbon-based group, and
(A)(II) at least one aliphatic or alicyclic carboxylic acid containing from about 2 to about 40 carbon atoms;
B. at least one sulfurized Group II metal phenate; and
C. a stabilizing amount of at least one triazole selected from the group consisting of benzotriazole and alkyl substituted benzotriazoles containing up to 15 carbon atoms in the alkyl group.

4,466,895

METAL SALTS OF LOWER DIALKYLPHOSPHORODITHIOIC ACIDS

Calvin W. Schroeck, Eastlake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 27, 1983, Ser. No. 508,369
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E 25 Claims

1. A metal salt of one or more dialkylphosphorodithioic acids wherein

(A) the alkyl groups each contain from two to four carbon atoms and at least one alkyl group is a butyl group,
(B) the total number of carbon atoms per phosphorus atom is less than 8,
(C) from about 30 to 90 mole percent of the alkyl groups are primary alkyl groups,
(D) from about 10 to 70 mole percent of the alkyl groups are secondary alkyl groups, and
(E) the metal salt is a zinc, copper or iron salt, mixtures thereof, or a mixture of calcium salt and one or more of said metal salts; provided that when only 2 alkyl groups are present, from about 30 to 80 mole percent of the alkyl groups are n-butyl groups, from about 20 to 70 mole percent of the said alkyl groups are isopropyl groups.

4,466,896

ETHYLENEDIAMINE TRIACETIC ACID SILOXANE STABILIZERS FOR INORGANIC SILICATES IN ANTIFREEZE/COOLANT FORMULATIONS

Jerome W. Darden, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,335
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—78.3 **13 Claims**

1. A gellation resistant aqueous glycol composition comprising
(a) 85 to 98 percent by weight of a glycol component selected from the group consisting of an alkylene glycol, an alkylene glycol ether and mixtures thereof,
(b) an effective amount to reduce corrosion of an inorganic alkali metal silicate, and
(c) an effective amount to improve gellation resistance of an organosiloxane having ethylenediamine triacetic acid as a solubilizing group.

4,466,897

PROCESS FOR THE MANUFACTURE OF SOAP POWDER

Peter W. Appel, Vlaardingen; Robert D. Den Outer, Rotterdam; Klaas Schutter, Vlaardingen, and Johan C. P. Broekhoff, Schiedam, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,659
Claims priority, application United Kingdom, Sep. 29, 1981, 8129409
Int. Cl.³ C11D *9/10, 9/12, 9/14, 11/02*
U.S. Cl. 252—108 **3 Claims**

1. A process for the production of a washing powder containing a sodium soap as the sole or principal organic detergent-active species, comprising: spray-drying or spray-cooling an aqueous slurry containing the soap and other fabric washing powder components to form spray-dried washing powder particles, and impregnating or co-granulating said particles with finely divided sodium carbonate in an amount sufficient to produce a solution of sodium ions having 0.5 to 4 molar initial concentration in the immediate locality of the individual spray-dried/spray-cooled particles on addition of the powder to water.

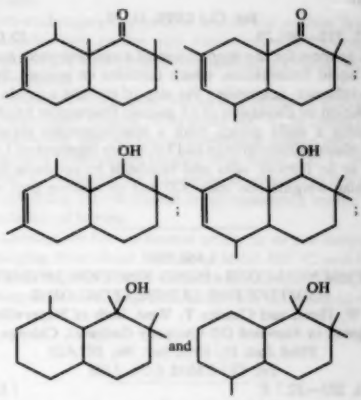
4,466,898

METHYL SUBSTITUTED OXOBICYCLO-4,4,0-DECANE DERIVATIVES, PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Takao Yoshida, West Long Branch, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 372,398, Apr. 26, 1982, Pat No. 4,387,048, which is a division of Ser. No. 277,130, Jun. 25, 1981, Pat. No. 4,339,467, which is a continuation-in-part of Ser. No. 182,451, Aug. 28, 1980, Pat. No. 4,320,772. This application Jun. 2, 1983, Ser. No. 500,532
Int. Cl.³ C11D *3/50*
U.S. Cl. 252—174.11 **4 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of solid or liquid anionic, cationic, nonionic or zwitterionic detergents, fabric softeners and fabric softener articles comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base, a fabric softener article component or a fabric softener composition an aroma augmenting or enhancing quantity of at least one oxobicyclo compound having a structure selected from the group consisting of:



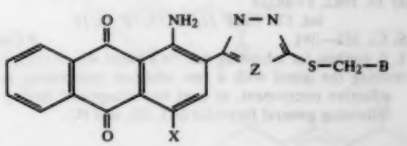
4,466,899

DYES FOR USE IN LIQUID CRYSTAL MIXTURES

Walter Ditter, Heidelberg; Karl-Heinz Etzbach, Mannheim; Dieter Horn, Heidelberg; Manfred Patsch, Wachenheim, and Heinz Ellingsfeld, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 4, 1982, Ser. No. 336,709
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1981, 3100533; Apr. 15, 1981, 3115147
Int. Cl.³ C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299.1 **4 Claims**

1. A liquid crystal guest-host composition for use in an electro-optical device, comprising a liquid crystalline host and a guest pleochroic coloring agent wherein said coloring agent is an anthraquinone compound represented by the formula:



where
X is hydrogen, hydroxyl, nitro, phenylmercapto or substituted or unsubstituted amino,
Z is O or S and
B is substituted or unsubstituted phenyl.

4,466,900

PROCESS FOR THE PREPARATION OF FLUORESCENT BRIGHTENER FORMULATIONS WHICH ARE STABLE ON STORAGE

Paul Horlacher, Möhlin, and Heinz Pfenninger, Lupsingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,233

Claims priority, application Switzerland, Sep. 22, 1981, 6105/81

Int. Cl.³ C09K 11/06

U.S. Cl. 252—301.23 23 Claims

1. A process for the preparation of a concentrated, storage-stable liquid formulation, which contains an anionic fluorescent brightener, comprising the step of treating a crude aqueous solution or dispersion of an anionic fluorescent brightener containing a sulfo group, with a semipermeable membrane which contains ionic groups and has a pore diameter of 1 to 500 Å, so as to remove salts and synthesis by-products having molecular weights less than 500 and to remove part of the water.

4,466,901

MOLYBDENUM-CONTAINING FRICTION MODIFYING ADDITIVE FOR LUBRICATING OILS

Mack W. Hunt, and Charles T. West, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 11, 1982, Ser. No. 387,623

Int. Cl.³ C10M 1/54, 1/48

U.S. Cl. 252—32.7 E 7 Claims

1. An approved lubricating oil composition comprising a lubricating oil and a material consisting essentially of the reaction product of:

(a) a phenolic compound comprising an alkyl-substituted phenol with the alkyl side chain having at least nine carbon atoms;

(b) a molybdenum compound;

(c) an amine compound comprising a mono- or polyamine having at least one aliphatic hydrocarbon based radical or an aromatic or aliphatic-substituted aromatic radical; and

(d) sulfur or a sulfur-yielding compound, said sulfur and said maine compound being present in amounts that will provide a sulfur/amine molar ratio that is within the range of 1:1 to 60:1, said reaction product being prepared by adding the reactants in any order at room temperature to form a reaction mixture, heating subsequently said mixture to an elevated temperature and holding said mixture at said elevated temperature for a period of time, said temperature and said time being sufficient to cause the formation of said reaction product.

4,466,902

RUST INHIBITOR

Shinichi Kumagae, Toyonaka, and Tatsuo Manabe, Osaka, both of Japan, assignors to Ipposha Oil Industries, Co., Ltd., Osaka, Japan

Filed Sep. 30, 1982, Ser. No. 428,719

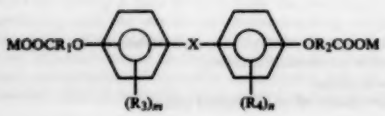
Claims priority, application Japan, Jan. 31, 1982, 57-13527; May 19, 1982, 57-85256

Int. Cl.³ C23F 11/19, 11/12, 11/16

U.S. Cl. 252—391 9 Claims

1. A method for inhibiting rust on a metal which comprises: treating the metal with a rust inhibitor comprising, as an effective component, at least one compound having the following general formulae (A), (B), and (C)

(A)



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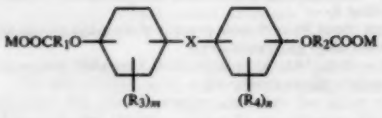
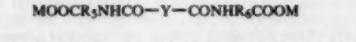
(B)



and



(C)

wherein R_1 and R_2 are independently a hydrocarbon group having 1 to 6 carbon atoms, R_3 and R_4 are independently a hydrocarbon group having 1 to 4 carbon atoms or a hydrocarbon group containing an aromatic ring and having 6 to 12 carbon atoms, R_5 and R_6 are independently a hydrocarbon group having 1 to 18 carbon atoms, m and n are independently 0 or an integer of 1 to 3, R_3 or R_4 being hydrogen in the case of m or n being 0, X is O, S, SO_2, CO or a hydrocarbon having 1 to 9 carbon atoms, Y is an aromatic hydrocarbon group having 6 to 10 carbon atoms and M is a cation, said rust inhibitor being in the form of a solution, a dispersion, or an emulsion.

4,466,903

UNSATURATED 1,3-DIOXOLANE STABILIZED WITH ALIPHATIC ALDEHYDE HYDRAZONE

Steven E. Pamer, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

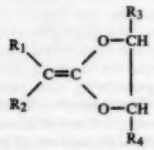
Division of Ser. No. 290,770, Aug. 7, 1981, Pat. No. 4,418,231. This application Jun. 16, 1983, Ser. No. 505,136

Int. Cl.³ C07C 17/42; C23G 5/02; C09K 3/00; C23F 11/00

U.S. Cl. 252—392 11 Claims

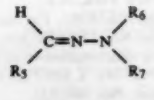
1. A composition comprising:

a. unsaturated 1,3-dioxolane represented by the structural formula



wherein R_1 and R_2 are each independently hydrogen, methyl or ethyl and wherein R_3 and R_4 are each independently hydrogen or alkyl containing from 1 to about 6 carbon atoms; and

b. a stabilizing amount of aliphatic aldehyde hydrazone represented by the formula



wherein R_5, R_6 and R_7 are each independently hydrogen or an aliphatic group of from 1 to about 4 carbon atoms with the proviso that said aliphatic aldehyde hydrazone has from 1 to about 7 carbon atoms.

4,466,904

POLYMERIZATION CO-INHIBITORS FOR VINYL AROMATIC COMPOUNDS

James M. Watson; James R. Butler, both of Big Spring, and Karen A. Mikkelson, Lubbock, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Jan. 10, 1983, Ser. No. 456,876
Int. Cl.³ C09K 15/26; C08F 2/38
U.S. Cl. 252—402 13 Claims

1. A composition for inhibiting polymerization of vinyl aromatic compounds and for reducing the viscosity of polymer formed, comprising:

(a) an effective amount of 2,6-dinitro-p-cresol;

(b) an effective amount of phenothiazine; and

(c) an effective amount of 4-tert-butylcatechol.

4,466,905

POLYMERIZATION INHIBITION PROCESS FOR VINYL AROMATIC COMPOUNDS

James R. Butler; James M. Watson; Debra L. Kendall, all of Big Spring, and Karen A. Mikkelson, Lubbock, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 11, 1983, Ser. No. 483,978
Int. Cl.³ C09K 15/22; C08F 2/38
U.S. Cl. 252—403 10 Claims

1. A process for inhibiting the polymerization of a vinyl aromatic compound, comprising subjecting the vinyl aromatic compound when heated to effective amounts of 2,6-dinitro-p-cresol and a phenylenediamine, respectively, in the presence of oxygen, the phenylenediamine having the formula

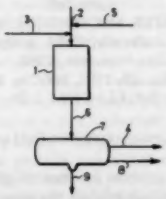
wherein R_1 and R_2 are alkyl, aryl or hydrogen.

4,466,906

CATALYST FOR THE OXIDATION OF MERCAPTANS TO DISULFIDES, PROCESS FOR THE PREPARATION THEREOF, AND ITS USE IN THE SWEETENING OF PETROLEUM DISTILLATES

Claude Marty, and Philippe Engelhard, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Apr. 7, 1983, Ser. No. 483,631
Claims priority, application France, Apr. 9, 1982, 82 06259
Int. Cl.³ B01J 31/04, 31/12
U.S. Cl. 502—11 12 Claims



1. A catalyst for the oxidation of mercaptans to disulfides, which comprises a metal complex of a polyaminoalkylpolycarboxylic acid deposited directly on a basic anion exchange resin.

4,466,907

ZEOLITE-RUTHENIUM-BORANE CATALYST COMPOSITION

Wen-Ghih Tsang, Framingham, Mass., and Lynn H. Slaugh, Cypress, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1982, Ser. No. 410,299
Int. Cl.³ B01J 21/02, 21/12
U.S. Cl. 502—74 2 Claims

1. A catalyst composition prepared by a process which comprises:

a. ion-exchanging the sodium ions of the sodium form of a faujasite type zeolite with ruthenium ions by contacting said zeolite with a solution containing a soluble ruthenium compound.

b. calcining the ruthenium exchanged zeolite in nitrogen at a temperature ranging from about 300° C. to about 600° C.

c. contacting the ruthenium-containing zeolite with hydrogen at a temperature ranging from about 300° C. to about 600° C. whereby the ruthenium is reduced to the metal,

d. contacting the ruthenium metal-containing zeolite with a solution of borane.

e. calcining the borane treated zeolite in air at a temperature ranging from about 300° C. to about 400° C. and then

f. contacting the borane-treated zeolite with hydrogen at a temperature ranging from about 300° C. to about 400° C.

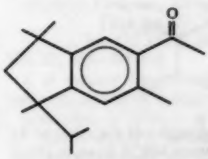
4,466,908

ISOPROPYL TETRAMETHYLINDAN MUSK, ORGANOLEPTIC USE THEREOF

Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge, and Roger E. Greene, Oakhurst, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,999
Int. Cl.³ C11B 9/00
U.S. Cl. 252—522 R 2 Claims

1. A composition of matter consisting essentially of a mixture of compounds having the structures:



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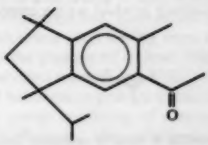
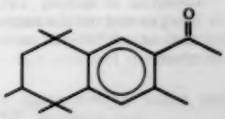
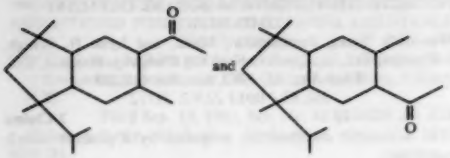


and

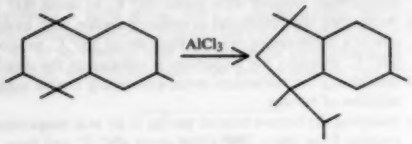


wherein a major proportion of the mixture consists of the compound having the structures:



produced according to the process consisting of the steps of:

(i) first rearranging hexamethyl tetralin with an aluminum chloride catalyst according to the reactions:



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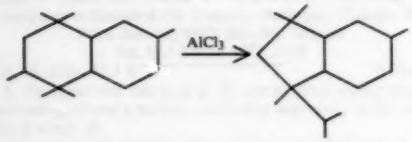
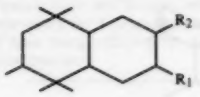


said first reaction taking place in the presence of tetrachloro ethylene solvent which is saturated with aluminum trichloride, said reaction taking place in the presence of an excessive aluminum chloride, the weight ratio of aluminum chloride:tetrachloro ethylene varying from about 35:100 up to about 60:100, the temperature of said first reaction varying from about −10° C. up to +10° C. and the time of reaction varying from about 0.5 hours up to about 10 hours, the weight ratio of tetrachloro ethylene:-hydrocarbon reactant having the structure:

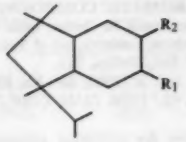


wherein one of R_1 or R_2 is hydrogen and the other of R_1 or R_2 is methyl varying from about 100:75 down to about 100:25; and

(ii) acylating the resulting product with a compound having the structure:

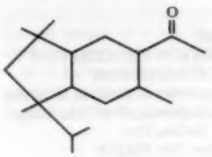
wherein Z represents a moiety selected from the group consisting of acetoxy, chloro and bromo, the reaction being carried out at a temperature of from about −10° up to about +20° C.; the mole ratio of compound having the structure:

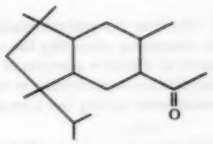
to the compound defined according to the structure:



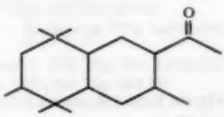
wherein one of R_1 or R_2 is hydrogen and the other of R_1 or R_2 is methyl varying from about 0.5:1 up to 1:0.5; and then

(iii) subjecting the resulting reaction product to fractional distillation whereby a mixture of compounds having the structures:

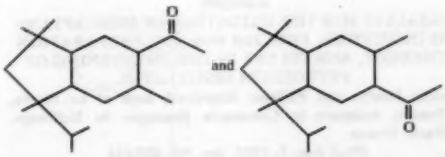




and



is isolated with the major part of said mixture being compounds having the structures:



4,466,909

OIL-IN-WATER MICROEMULSION FLUID

Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 29, 1980, Ser. No. 191,589

Int. Cl.³ C10M 1/06

U.S. Cl. 252—49.5 **3 Claims**

1. An oil-in-water micro-emulsion fluid consisting essentially of:

(a) 0.09 to 49.99 percent by mass of oil and a surfactant-/cosurfactant which inhibits the separation of the micro-emulsion into separate phases;

(b) 50 to 99.9 percent by mass water;

(c) 0.01 to 10 percent by mass of an oil soluble metal containing antiwear agent selected from the metal dialkyldithio-

phosphates, metal dithiocarbamates, metal carboxylates and thiocarboxylates; and

(d) 0.01 to 10 percent by mass of urea.

4,466,910

ELECTRICALLY CONDUCTING POLYMERS

David W. House, Arlington Heights, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plains, Ill.

Filed Oct. 12, 1982, Ser. No. 433,942

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—500 9 Claims

1. An electrically conducting polymer composition comprising a polymer whose repeating unit has the structure,

(=CH—Y—CH=N—Z—N=)

where Z is an aromatic divalent moiety whose parent is selected from the group consisting of benzene, napthalene, anthracene, biphenyl, diphenylmethane, azobenzene, anthraquinone, pyridine, acridine and stilbene and Y is an aromatic divalent moiety whose parent is benzene, and a p-type or n-type dopant in an amount sufficient to increase electrical conductivity.

4,466,911

ELECTRICALLY CONDUCTING POLYMERS

David W. House, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 12, 1982, Ser. No. 433,943

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—500 8 Claims

1. An electrically conducting polymer composition comprising a polymer whose repeating unit has the structure,

(=CH—CH=N—A—N=)

where A is an aromatic divalent moiety whose parent is selected from the group consisting of benzene, napthalene, anthracene, biphenyl, azobenzene, pyridine, acridine and stilbene and an effective amount, sufficient to increase electrical conductivity, of a n-type or p-type dopant.

4,466,912

CONDUCTIVE THERMOPLASTIC COMPOSITIONS

Walter J. Phillips, McDonald, Pa., and Herbert L. Rawlings, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 429,914

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—512 4 Claims

1. A thermoplastic molding composition comprising

(i) conductive particles, in the form of flakes selected from the group consisting of metals, metal oxides and metal alloys, characterized in that their resistivity, in micro-ohms-centimeter at 20° C., is below 15 and in that their largest dimension does not exceed 0.250 inches and

(ii) a resinous blend of a polycarbonate resin and an ABS resin prepared by either bulk or mass suspension polymerization having a particle size distribution ranging from about 0.2 to about 10 microns said blend being characterized in that the weight of said polycarbonate relates to that of said ABS at from about 30/70 to about 70/30,

said conductive particles being present in an amount of at least 8% relative to the volume of said (i) plus said (ii).

4,466,913

PHOSPHORUS-CONTAINING COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Takashi Tsuruoka, Kawasaki; Satoshi Imai, Yokohama; Atsuyuki Satoh, Yokohama; Tetsuro Watanabe, Yokohama; Koji Watanabe, Machida; Shigeharu Inouye, and Taro Niida, both of Yokohama, all of Japan, assignors to Maiji Seika Kaisha Ltd., Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 388,209

Claims priority, application Japan, Jun. 30, 1981, 56-100566; Feb. 26, 1982, 57-28925

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R 1 Claim

1. 2-amino-4-(hydroxy)phosphinoylbutyryl-L-alanyl-L-alanine.

4,466,914

PROCESS FOR THE CONVERSION OF PRIMARY AND SECONDARY ALCOHOLS TO THEIR CORRESPONDING THIOLS AND THIOL ESTERS

George G. Hazen, Westfield, and Ralph P. Volante, East Windsor, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 4, 1981, Ser. No. 270,321

Int. Cl.³ C07C *149/18, 153/01, 153/017, 153/023*

U.S. Cl. 260—239 A 5 Claims

1. A process for preparing mercaptans RSH comprising the step of treating the alcohol ROH with thiol acid R′ COSH in the presence of hydroxyl activating reagent selected from the group consisting of triphenyl phosphine-dialkylazodicarboxylate or triphenylphosphite-dialkylazodicarboxylate followed by hydrolytic or reductive cleavage of the radical R′ CO to yield the mercaptan RSH: wherein R′ is selected from the group consisting of lower alkyl having 1–6 carbons, phenyl or phenyl substituted by chloro, nitro, or methoxyl; wherein the alcohol ROH is a primary or secondary alkanol having 1–12 carbon atoms and wherein the molar ratio of alcohol to thiol acid to hydroxyl activating reagent is 1:1:1 or more.

4,466,915

NON-CATALYTIC KETOFORM SYNTHESES

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,371

Int. Cl.³ C07D *243/08;* C10M *1/32, 1/24*

U.S. Cl. 260—239.3 R 11 Claims

1. A method for introducing an amine substituent into a carbonyl-containing compound comprising,

contacting a primary or secondary amine reactant compound which is an amine nucleophilic agent with said carbonyl-containing compound selected from the group consisting of a saturated acyclic monoketone, a saturated cyclic monoketone and, benzaldehyde, optionally substituted with lower alkyl having from 1 to about 6 carbon atoms, in the absence of a phase transfer catalyst and a primary alcohol solvent, and in the presence of a base and sufficient haloform to provide a reaction product selected from the group consisting of a monoazacycloalkanone, diazacycloalkanone, alpha-aminoacetamide, and alpha-amino acetate;

said carbonyl-containing compound being present in an amount from about 2 to about 25 times greater than the molar amount required to react with said reactant compound;

maintaining the temperature during reaction below that which degrades said reactant compound; and,

recovering said reaction product having said amine substituent.

4,466,916

SUBSTITUTED 2-KETO-1,4-DIAZACYCLOALKANES

John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 88,484, Oct. 26, 1979, Pat. No. 4,292,240, which is a continuation-in-part of Ser. No. 835,065, Sep. 21, 1977, Pat. No. 4,190,571. This application Jun. 17, 1982, Ser. No. 274,586

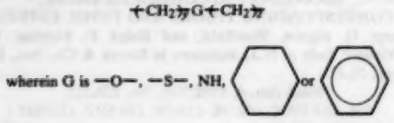
Int. Cl.³ C07D *401/12, 403/12*

U.S. Cl. 260—239.3 R 5 Claims

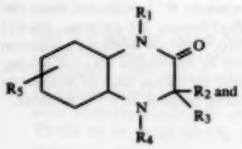
1. A bis compound represented by the formula

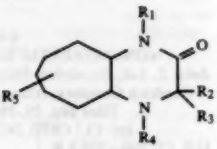
M'—X—M''

wherein M' and M'' represents two 2-keto-1,4-diazacycloalkane moieties connected through each 1-position of each moiety, or each 4-position of each moiety via a bivalent radical X selected from the group consisting of bivalent alkyl having from 1 to 24 carbon atoms, and the structure



and y and z are individually an integer from 1 to about 6; and, wherein M' and M'' represent polysubstituted 2-keto-1,4-diazacycloalkanes having a fixed two-carbon bridge between the N^1 and N^4 atoms of the diaza ring having a structural formula selected from





wherein,

R_1 and R_4 independently represent hydrogen, alkyl having from 1 to 24 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

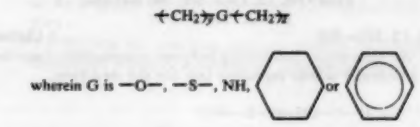
R_4 optionally also represents oxygen, hydroxy or alkoxy having from 1 to 8 carbon atoms;

R_2 and R_3 independently represent alkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, cycloalkyl having from 5 to 14 carbon atoms, hydroxy-cycloalkyl having from 5 to 14 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms; and, R_5 represents alkyl having from 1 to 12 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms.

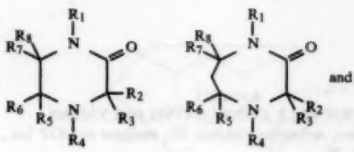
2. A bis compound represented by the formula

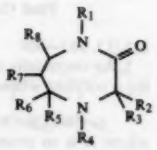
M'''—X—M''''

wherein M''' and M'''' represent two 2-keto-1,4-diazacycloalkane moieties connected through each 1-position of each moiety, or each 4-position of each moiety via a bivalent radical X selected from the group consisting of bivalent alkyl having from 1 to 24 carbon atoms, and the structure



and y and z are individually an integer from 1 to about 6; and, wherein M''' and M'''' represent polysubstituted 2-keto-1,4-diazacycloalkanes having a fixed two-carbon bridge between the N^1 and N^4 atoms of the diaza ring having a structural formula selected from





wherein,

R_1 and R_4 independently represent hydrogen, alkyl having from 1 to 24 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

R_4 optionally also represents oxygen, hydroxy or alkoxy having from 1 to 8 carbon atoms;

R_2 and R_3 independently represent alkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, cycloalkyl having from 5 to 14 carbon atoms, hydroxy-cycloalkyl having from 5 to 14 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

R_5, R_6, R^7, R_8 independently represent alkyl having from 1 to 12 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, aminoalkyl having from 1 to 12 carbon atoms, alkenyl having from 2 to 14 carbon atoms, and unsubstituted hydrocarbon aralkyl having from 7 to 14 carbon atoms;

R_7, R_8 additionally also represent hydrogen; and,

R_5, R_6 may when taken together with the carbon atom to which they are attached, form an alkylene ring or a pyridine ring.

4,466,917

MALARIA VACCINE

Ruth S. Nussenzweig; G. Nigel Godson, and Victor Nussenzweig, all of New York, N.Y., assignors to New York University, New York, N.Y.

Filed Feb. 12, 1981, Ser. No. 234,096

Int. Cl.³ C07G 7/00; C12P 21/00; C12N 15/00

U.S. Cl. 260—112 R 5 Claims

1. An antigenic protein consisting essentially of a sporozoite polypeptide selected from the group consisting of Pb-44, derived from *Plasmodium berghei;* Pk-44, derived from *Plasmodium knowlesi;* Pf-44, derived from *Plasmodium falciparum;* and Pv-44, derived from *Plasmodium vivax;* in purified form.

4,466,918

METHOD OF PREPARING THYMOSIN ALPHA 1 AND DERIVATIVES THEREOF

Christian Birr, St.Ilgen, and Ulrich Stollenwerk, Heidelberg, both of Fed. Rep. of Germany, assignors to Max-Planck Gesellschaft Zur Förderung Der Wissenschaften E.V., Gottingen, Fed. Rep. of Germany

Division of Ser. No. 133,031, Mar. 24, 1980, Pat. No. 4,353,821. This application Jul. 29, 1982, Ser. No. 403,218

Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919592

Int. Cl.³ C07C 103/52

U.S. Cl. 260—112.5 R 10 Claims

1. Process for the preparation of thymosin alpha 1 or a derivative thereof, in which at least one of the amino acids 10, 15, 21, 25 and 28 is present as amide or alkyl amide and/or the acetyl group is replaced by a different acyl group, by the preparation of a series of peptide fragments containing protective groups, characterized by the fact that:

(a) an N-terminally unprotected, carrier-bound C-terminal peptide fragment selected from the group consisting of Glu-Ala-Glu-Asn; Lys-Glu-Val-Val-Glu-Glu-Ala-Glu-Asn; Thr-Lys-Asp-Leu-Lys-Glu-Lys-Lys-Glu-Val-Val-Glu-Glu-Ala-Glu-Asn; Thr-Ser-Ser-Glu-Ile-Thr-Thr-Lys-Asp-Leu-Lys-Glu-Lys-Lys-Glu-Val-Glu-Glu-Ala-Glu-Asn-Lys-Glu-Val-Val-Glu-Glu-Ala-Glu-Asn; Ser-Asp-Ala-Ala-Val-Asp-Thr-Ser-Ser-Glu-Ile-Thr-Thr-Lys-Asp-Leu-Lys-Glu-Lys-Lys-Glu-Val-Val-Glu-Glu-Ala-Glu-Asn-Lys-Glu-Val-Glu-Glu-Ala-Glu-Asn-Glu-Ala-Glu-Asn is condensed in at least 1.5 times less than the stoichiometric amount with the adjacent N-terminally protected, C-terminally unprotected peptide fragment, in an anhydrous organic solvent containing dicyclohexylcarbodiimide and 1-hydroxybenzotriazole,

(b) by the addition of trifluoroacetic acid in a slight stoichiometric excess, the Ddz group of the condensed fragment is split off,

(c) excess acid is neutralized with a organic base, and

(d) the N-terminally unprotected, lengthened C-terminal fragment is condensed repeatedly with the next N-terminally Ddz-protected fragment by repetition of steps (a), (b) and (c) until the peptide chain is complete, and lastly the remaining protective groups are split off in the conventional manner, using t-butyl ester groups as lateral protective groups for Asp and Glu, tertiary butyl groups for Ser and Thr, benzyloxycabonyl groups for Lys, and 4,4'-dimethoxybenzohydryl groups for Asn.

4,466,919

PEPTIDE SUBSTRATES FOR MAMMALIAN COLLAGENASE

Harold I. Weingarten, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1982, Ser. No. 450,318

Int. Cl.³ C07C 103/52; C12Q 1/38

U.S. Cl. 260—112.5 R 4 Claims

1. A peptide material having activity as a substrate for collagenase selected from the group consisting of

R_1-Pro-Leu-Gly-Leu-Leu-Gly-R_2

and

R_1-Pro-Leu-Gly-Leu-Ala-Gly-R_2,

wherein

R_1 = H or N-protecting group, and

R_2 = terminal amide, carboxyl or ester group.

4,466,920

DISAZO COMPOUNDS HAVING A FURTHER UNSUBSTITUTED OR SUBSTITUTED SULFOPHENYL DIAZO COMPONENT RADICAL AND A 4-ALKOXY- OR ARYLSULFONYLOXY-BENZENE COUPLING COMPONENT RADICAL HAVING AN ACYLAMINO SUBSTITUENT

Hanspeter Uehlinger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

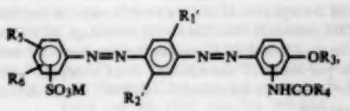
Continuation-in-part of Ser. No. 884,412, Mar. 8, 1978, abandoned. This application Sep. 13, 1979, Ser. No. 74,952

Claims priority, application Switzerland, Mar. 14, 1977, 3157/77; Jul. 11, 1979, 6478/79

Int. Cl.³ C09B 31/078, 31/08; D06P 3/24, 3/32

U.S. Cl. 260—187 16 Claims

1. A compound of the formula



or a mixture of such compounds, wherein

each of R_1' and R_2' is independently hydrogen, methyl or methoxy,

R_3 is methyl, ethyl, phenylsulfonyl or tosyl,

R_4 is methyl, ethyl, methoxy, ethoxy or amino,

R_5 is hydrogen, chloro, C_{1-2}alkyl, C_{1-2}alkoxy or acetamido,

R_6 is hydrogen, chloro or methyl, with the proviso that R_6 is hydrogen when R_5 is acetamido, and

M is hydrogen or a non-chromophoric cation.

4,466,921

4-DIMETHYLAMINOPYRIDINIUM CHLOROCHROMATE AS AN OXIDIZING AGENT FOR CONVERSION OF ALCOHOLS TO THEIR RESPECTIVE KETONES

Frank S. Guziec, Jr., Las Cruces, N. Mex., assignor to Thiokol Corporation, Chicago, Ill.

Division of Ser. No. 406,585, Aug. 9, 1982, Pat. No. 4,438,269. This application Sep. 30, 1983, Ser. No. 537,770

Int. Cl.³ C07J 1/00

U.S. Cl. 260—397.3 4 Claims

1. A method of oxidizing alcohols to their corresponding carbonyl compounds comprising reacting said alcohol and 4-dimethylaminopyridinium chlorochromate.

3. The method of claim 1 wherein the alcohol is a steroid compound.

4,466,922

PREPARATION OF 3-ALKYL-3-ACYLOXY-4-HYDROXYBUT-1-ENES

Hans-Martin Weitz, Bad Durkheim, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

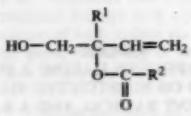
Filed Sep. 13, 1982, Ser. No. 417,514

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137804

Int. Cl.³ C11C *3/02*

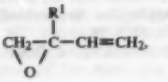
U.S. Cl. 260—410.9 R 10 Claims

1. A process for the preparation of a 3-alkyl-3-acyloxy-4-hydroxybut-1-ene of the formula



I

where R^1 is a hydrocarbon radical of 1 to 5 carbon atoms and R^2 is a hydrogen or a hydrocarbon radical of 1 to 15 carbon atoms, which process comprises reacting a 3-alkyl-3,4-epoxybut-1-ene as an epoxide of the formula



II

where R^1 has the above meanings, with from 1.1 to 20 moles per mole of the epoxide II of a carboxylic acid of the formula R^2—COOH, where R^2 has the above meanings, at a temperature of from −20° to 150° C. and in the presence of from 0.01 to 1 mole per mole of the epoxide II of a copper salt of a carboxylic acid of the formula R^2—COOH, where R^2 has the above meanings.

4,466,923

SUPERCRITICAL CO_2 EXTRACTION OF LIPIDS FROM LIPID-CONTAINING MATERIALS

John P. Friedrich, Green Valley, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 1, 1982, Ser. No. 364,290

Int. Cl.³ C11B *11/00*

U.S. Cl. 260—412.4 7 Claims

1. A method for the extraction of a lipid from a lipid-containing material by means of a carbon dioxide solvent under supercritical conditions, said method comprising:

a. contacting said lipid-containing material with carbon dioxide at a pressure within the range of at least 550 bar and a temperature within the range of about 60° to 100° C. in order to dissolve the lipid in the carbon dioxide, whereby the combination of pressure and temperature is sufficient for the solubility of said lipid in said carbon dioxide to be at least about 5% by weight; and

b. separating said carbon dioxide with the dissolved lipid from said material.

4,466,924

PLATINUM-DIAMINE COMPLEXES, A PROCESS FOR THE PREPARATION THEREOF, A PROCESS FOR THE PREPARATION OF A MEDICINE USING SUCH A PLATINUM-DIAMINE COMPLEX FOR THE TREATMENT OF MALIGNANT TUMORS IN MICE AS WELL AS A MEDICINE THUS FORMED

Francois Verbeek, Harmelen; Eric J. Bulten, Blaricum, and Jan Berg, Nieuwegein, all of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

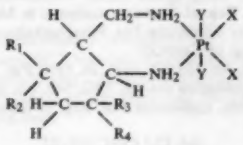
Filed Feb. 26, 1982, Ser. No. 352,538

Claims priority, application Netherlands, Mar. 3, 1981, 8101026

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R 5 Claims

1. Platinum-diamine complexes having the formula:



wherein R_1 and R_2 independently from each are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl and aralkyl group, while R_1 and R_2, together may be a single cycloalkyl group, R_3 and R_4 independently of each other are selected from the group consisting of hydrogen, alkyl, aryl and aralkyl group, X is selected from the group consisting of a chlorine, bromine, iodine sulphate radical, acetate radical, oxalate, malonate, hydroxymalonate, and a carboxyphthalate group and Y independently from X is selected from the group consisting of chlorine, bromine, iodine, hydroxyl, nitrate and carboxylate.

4,466,925

METHOD FOR THE PREPARATION OF TRANSITION METAL COMPLEXES

Milton Braid, Haddonfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 9, 1982, Ser. No. 366,952

Int. Cl.³ C07F *15/04*

U.S. Cl. 260—439 R 6 Claims

1. In a method for the preparation of complexes of transition metal 2,2′-thiobis(alkylphenolates) with hydroxy-organic ligands, the improvement which comprises the direct reaction of said thiobis(alkylphenol) with an alkali metal carbonate and a transition metal salt in a hydroxyorganic reactant-solvent in a weight ratio of hydroxyorganic reactant-solvent to transition metal salt to alkali metal carbonate of from about 1.5–1:1 to about 40–2.5:1 at reflux temperatures.

4,466,926

PROCESS FOR THE PREPARATION OF α,ω-BIS-FLUOROSULFATOPERFLUOROALKANES, AND A FEW SPECIAL REPRESENTATIVES OF THESE COMPOUNDS

Hans Millauer, Eschborn, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,119

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128118

Int. Cl.³ C07C *141/10*

U.S. Cl. 260—458 F 11 Claims

1. A method for making an alpha, omega-bis-fluorosulfatoperfluoroalkane which comprises introducing a perfluorinated alpha-olefin into a liquid phase containing peroxodisulfu-

ryl difluoride at a substantially constant concentration of about 0.005 to 0.2 mole per liter.

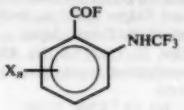
4,466,927

METHOD FOR THE PREPARATION OF 2-(TRIFLUOROMETHYL)PHENYL CARBAMIC FLUORIDE

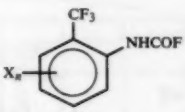
Henry C. Lin, and Byron R. Cotter, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,636
Int. Cl.³ C07C *125/03*
U.S. Cl. 260—544 C **10 Claims**

1. A method for the preparation of a 2-(trifluoromethyl)phenyl carbamic fluoride which comprises isomerizing an N-(trifluoromethyl)-anthraniloyl fluoride of the formula



wherein n is 0 to 2 and X is independently selected from the group, fluoro-, chloro-, bromo-, phenyl-, chlorophenyl-, fluorophenyl-, and bromophenyl-, in the presence of hydrogen fluoride to form a 2-(trifluoromethyl)phenyl carbamic fluoride of the formula



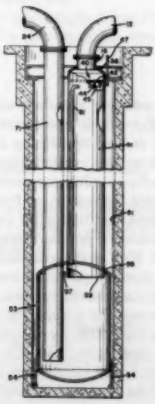
where n and X are as defined above.

4,466,928

APPARATUS FOR DISSOLUTION OF GASES IN LIQUID

Peter Kos, Ridgefield, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 938,130, Aug. 30, 1978, abandoned. This application Jul. 27, 1982, Ser. No. 402,410
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—76 **3 Claims**



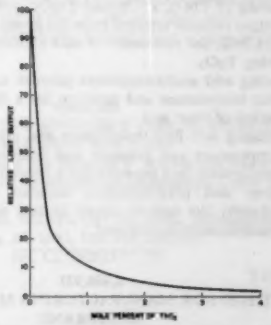
1. Apparatus for dissolving gas in a liquid comprising, an inlet conduit for introducing a liquid stream into said apparatus, a contact chamber arranged to receive said liquid stream from said inlet conduit, means for injecting a gas into said apparatus to produce a mixed gas-liquid stream means for maintaining the mixed gas-liquid stream in said contact chamber at elevated pressure, a flow distributor proximate the upper end of said contact chamber comprising a constriction plate extending across the diameter of said contact chamber, said constriction plate having a plurality of nozzles fixed thereto all extending in a downstream direction forming an upper gas trap between said constriction plate and the downstream ends of said nozzles, said contact chamber being of essentially uniform cross-section so that a substantially constant velocity of said mixed gas-liquid stream may be maintained therein, a gas disengagement chamber at the lower end of said contact chamber and having a substantially larger diameter than said contact chamber, the open lower end of said contact chamber penetrating the upper wall of said disengagement chamber and extending into the latter chamber a predetermined distance thereby forming a lower gas trap between the open lower end of said contact chamber and the aforesaid upper wall, a recycle conduit external to said contact chamber connecting said lower gas trap in said disengagement chamber to said upper gas trap so that said gas in said lower gas trap is injected into said upper gas trap by the differential pressure therebetween for further dissolution in said liquid, and an outlet to permit the treated liquid to exit said gas disengagement chamber, wherein said outlet penetrates the upper wall of said disengagement chamber and extends into said disengagement chamber to a point proximate to bottom thereof and said means for injecting a gas into said apparatus is a conduit in flow communication with the upper end of said contact chamber.

4,466,929

PREPARATION OF YTTRIA-GADOLINIA CERAMIC SCINTILLATORS BY VACUUM HOT PRESSING

Charles D. Greskovich; Dominic A. Cusano, both of Schenectady, N.Y., and Frank A. DiBianca, Chapel Hill, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,816
Int. Cl.³ C04B *33/32*
U.S. Cl. 264—1.2 **19 Claims**



1. A method for preparing a polycrystalline ceramic x-ray or gamma ray scintillator body comprising the steps of:

preparing a multicomponent powder consisting essentially of between about 5 and 50 mole percent Gd_2O_3, and between about 0.02 and 12 mole percent of at least one rare earth activator oxide selected from the group consisting of Eu_2O_3, Nd_2O_3, Yb_2O_3, Dy_2O_3, Tb_2O_3, and Pr_2O_3, the remainder of said multicomponent powder being Y_2O_3;

pressing said multicomponent powder under vacuum at a first temperature and pressure for a first predetermined period of time; and

increasing said first temperature and pressure to a second

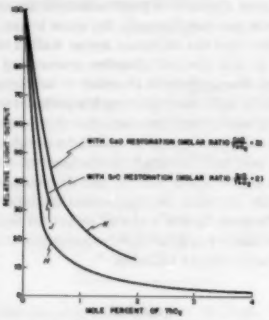
temperature and pressure and maintaining said second temperature and pressure for a second period of time to form said polycrystalline ceramic scintillator body, whereby the optical clarity of said scintillator body is transparent-to-translucent.

4,466,930

PREPARATION OF YTTRIA-GADOLINIA CERAMIC SCINTILLATORS BY VACUUM HOT PRESSING

Charles D. Greskovich; Dominic A. Cusano, both of Schenectady, N.Y., and Frank A. DiBianca, Chapel Hill, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,830
Int. Cl.³ C04B 33/32
U.S. Cl. 264—1.2 21 Claims



1. A method for preparing a polycrystalline ceramic X-ray or gamma ray scintillator body comprising the steps of:

preparing a multicomponent powder consisting essentially of between about 5 and 50 mole percent Gd_2O_3, between about 0.02 and 12 mole percent of at least one rare earth activator oxide selected from the group consisting of Fu_2O_3, Nd_2O_3, Yb_2O_3, Dy_2O_3, Tb_2O_3, and Pr_2O_3, at least one transparency promoter selected from the group consisting of ThO_2, ZrO_2, and Ta_2O_5, and at least one light output restorer selected from the group consisting of CaO and SrO, the remainder of said multicomponent powder being Y_2O_3,

pressing said multicomponent powder under vacuum at a first temperature and pressure for a first predetermined period of time; and

increasing said first temperature and pressure to a second temperature and pressure and maintaining said second temperature and pressure for a second period of time to form said polycrystalline ceramic scintillator body, whereby the optical clarity of said scintillator body is transparent-to-translucent.

4,466,931

METHOD FOR MANUFACTURING MICROPOROUS MEMBRANE

Gerald B. Tanny, Rehovot, Israel, assignor to Gelman Sciences Inc., Ann Arbor, Mich.

Filed Aug. 5, 1982, Ser. No. 405,226
Int. Cl.³ B29D 27/04
U.S. Cl. 264—22 7 Claims

1. A method for manufacturing fluid permeable microporous membrane comprising:

A. mixing into a liquid vehicle a material

(1) which is rapidly polymerizable under ultraviolet or electron beam irradiation to a solid polymer insoluble and non-dispersible in the liquid vehicle such that when the polymer is formed it rapidly segregates from the liquid vehicle, and

(2) which is selected from the group consisting of the organic monomers, the organic oligomers and mixtures thereof which are soluble in the liquid vehicle whereby upon said mixing there results a composition which is a liquid solution of said material in said liquid vehicle, said liquid vehicle being chemically inert relative to said material;

B. forming said composition into a thin liquid layer;

C. exposing said thin liquid layer of the composition to ultraviolet or electron beam irradiation whereby said material rapidly polymerizes to said solid polymer which rapidly segregates from the liquid vehicle thereby to form a membrane having a solid continuous network of intercommunicating cells; and

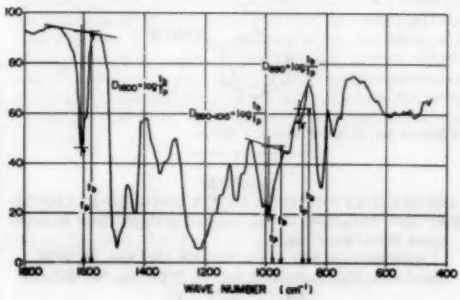
D. removing said liquid vehicle from the membrane.

4,466,932

PROCESS FOR PRODUCING CARBON ARTICLES

Hiroaki Koyama, and Shigeo Shimizu, both of Kobe, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,622
Claims priority, application Japan, Dec. 30, 1981, 56-211541; Mar. 4, 1982, 57-33098
Int. Cl.³ B29C 25/00
U.S. Cl. 264—29.3 27 Claims



1. A process for producing a carbon article, which comprises molding a precursor article under heat from a heat-moldable resin composition at least containing a granular or powdery resin resulting from the condensation of a phenol, an aldehyde and optionally a nitrogen-containing compound having at least two active hydrogens, or from a heat-moldable species of said resin alone, and thereafter carbonizing the precursor article, said granular or powdery resin being characterized in that (A) at least 30% of the granular or powdery resin consists of spherical primary particles and their secondary agglomerated particles, each having a particle diameter in the range of 0.1 to 150 microns, the granular or powdery resin has (B) such a size that at least 50% by weight thereof can pass through a 100 Tyler mesh sieve, and (C) has a free phenol content, determined by liquid chromatography, of not more than 500 ppm, and (D) the granular or powdery resin which is a condensation product of a phenol and an aldehyde has a $D_{990\text{-}1015}/D_{1600}$ ratio of from 0.2 to 9.0 and a D_{890}/D_{1600} ratio of from 0.09 to 1.0 in its infrared absorption spectrum measured by a KBr tablet method, in which D_{1600} represents the absorp-

tion intensity of an absorption peak at 1600 cm^{-1}, $D_{990\text{-}1015}$ represents the highest absorption intensity of absorption peaks in the range of 990 to 1015 cm^{-1}, and D_{890} represents the absorption intensity of an absorption peak at 890 cm^{-1}, and the granular or powdery resin which is the nitrogen-containing condensation product of a phenol, an aldehyde and a nitrogen-containing compound having at least two active hydrogens has a $D_{960\text{-}1020}/D_{1450\text{-}1500}$ ratio of from 0.1 to 2.0 in its infrared absorption spectrum measured by a KBr tablet method in which $D_{1450\text{-}1500}$ represents the highest absorption intensity of absorption peaks in the range of 1450 to 1500 cm^{-1}, and $D_{960\text{-}1020}$ represents the highest absorption intensity of absorption peaks in the range of 960 to 1020 cm^{-1}.

4,466,933

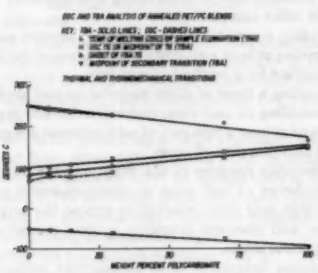
HEAT-RESISTANT FOAMED PLASTIC MATERIALS

Mark T. Huggard, Mechanicsville, Va., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 454,202, Dec. 28, 1982,. This application Jan. 4, 1984, Ser. No. 568,151

Int. Cl.³ B29H *7/20*; C08J *9/02*

U.S. Cl. 264—54 **12 Claims**

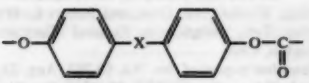


1. A process for preparing a thermoformed, foamed, crystalline, plastic sheet, said sheet being essentially composed of the foamed reaction product of a polyester and a polycarbonate, said process comprising the steps of:

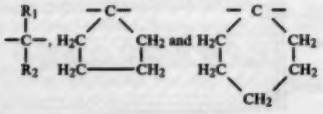
(i) introducing into an extruder a mixture consisting of:

(a) a high molecular weight linear polyester, which is a polycondensation product of an aromatic dicarboxylic acid and a glycol; and

(b) a high molecular weight linear aromatic polycarbonate represented by the repeating structural unit of the formula:



wherein X is a divalent hydrocarbon radical with a total of from 2 up to about 9 carbon atoms selected from the group consisting of



in which R_1 represents a member selected from the group consisting of hydrogen and lower alkyl and R_2 represents a member selected from the group consisting of phenyl and alkyl of 1 to 7 carbon atoms, in a weight ratio of (a):(b) of about 20:1 to 1:20;

(ii) reacting said blend of step (i) inside said extruder by providing sufficient mixing and heating to homogeneously react said polyester (a) and polycarbonate (b), thereby releasing carbon dioxide from said polycarbonate into the reacted polyester/polycarbonate mass;

(iii) passing said reacted polyester/polycarbonate mass of step (ii) through the die section of said extruder, said die section being adapted to cast said polyester/polycarbonate mass therefrom in the form of a sheet, thereby causing said released carbon dioxide to expand in said mass and reduce the density of the extruded sheet, the temperature of the extruded sheet being sufficient to cause rapid crystallization of said sheet;

(iv) passing the foamed, extruded sheet of step (iii) through one or more chill rolls, to reduce the tempeature of said sheet, thereby preventing substantial crystallization of said sheet, whereby said sheet can be thermoformed, pursuant to steps (v–vii) recited hereinafter, without substantial shrinkage, the temperature of the thusly cooled sheet being substantially insufficient to cause crystallization of said sheet;

(v) heating said sheet of step (iv), said sheet not being in contact with a mold, said sheet not being subjected to forces comprising a differential in applied pressure to said sheet, said sheet being heated to a temperature sufficient to cause slow crystallization of said sheet, thereby forming a preheated sheet;

(vi) contacting said preheated sheet of step (v) with a mold by applying forces comprising a differential in applied pressure to said sheet so as to make said sheet conform to said mold, said mold being maintained at a temperature higher than that of said preheated sheet sufficient to further heat said sheet to a temperature sufficient to rapidly crystallize said sheet;

(vii) allowing said sheet of step (vi) to remain in contact with said mold for a time sufficient to provide sufficient crystallization of said sheet so as to enable the molded sheet to essentially retain its shape without substantial deformation when the, thusly, thermoformed sheet is subsequently cooled to room temperature and is then heated to 400° F. and is maintained at 400° F. for one hour; and

(viii) removing said thermoformed sheet of step (vii) from said mold.

4,466,934

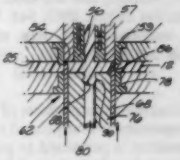
HOT SPRUE VALVE ASSEMBLY FOR AN INJECTION MOLDING MACHINE

Albert Cane, Torrance, and Mitchell P. Brown, San Pedro, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 202,824, Oct. 31, 1980,. This application Aug. 27, 1981, Ser. No. 296,730

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—106 **2 Claims**



1. In an injection molding machine for producing centrally apertured record discs, said machine including a generally disc-shaped mold cavity and a sprue bushing for flow of molten disc-forming material into the mold cavity, a method of

controlling flow of the disc-forming material into the mold cavity comprising the steps of:

positioning a sleeve valve in a normal position in spaced relation with the sprue bushing on the side of the mold cavity opposite the sprue bushing for allowing flow of the molten disc-forming material through the sprue bushing into the mold cavity;

positioning an ejector pin concentrically within the sleeve valve in a normal position advanced toward the mold cavity;

moving the sleeve valve through the mold cavity prior to solidification of the disc-forming material therein into bearing engagement with the sprue bushing to prevent further flow of molten disc-forming material through the sprue bushing into the mold cavity and to mold an aperture in the record disc formed in the mold cavity;

substantially simultaneously retracting the ejector pin from the mold cavity to accommodate disc-forming material displaced by the sleeve valve;

returning the ejector pin to its normal position to eject from the machine the portion of the disc-forming material displaced from the aperture; and

returning the sleeve valve to its normal position.

4,466,935

ARAMID SPINNING PROCESS

Thomas I. Bair, Wilmington, Del., and Leslie W. Gulrich, Jr., Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 22, 1983, Ser. No. 487,605

Int. Cl.³ D01F *6/00*

U.S. Cl. 264—184 **5 Claims**

1. A process for spinning high strength, high modulus aromatic polyamide filaments from aromatic polyamides having an inherent viscosity of at least 4.0 whose chain-extending bonds are coaxial or parallel and oppositely directed by extruding downwardly an anisotropic solution having a polyamide concentration of at least 30 g/100 ml 98.0–100.2% sulfuric acid through a layer of noncoagulating fluid into a coagulating liquid whereby coagulating liquid passes downwardly through a spin tube along with the filaments, the filaments are separated from the coagulating liquid and are mechanically forwarded at 200 to 1000 yards per minute (ypm) to one or more washing and/or neutralization stages, wherein the sulfuric acid content is reduced to no more than 50% by weight and a tension in grams per denier of at least 1.9×10^{-3} (ypm) -2.5×10^{-4} (yarn denier) but no less than 0.4 gpd is applied to filaments between the exit of the spin tube and the washing and/or neutralization stages.

4,466,936

PRODUCTION OF MOLDS USING GEL COMPOSITIONS WITH DEPOT ACTION BASED ON A POLYURETHANE MATRIX AND RELATIVELY HIGH MOLECULAR WEIGHT POLYOLS

Dieter Schäpel, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 342,035, Jan. 22, 1982, Pat. No. 4,404,296. This application Jun. 9, 1983, Ser. No. 502,850

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103499; Feb. 3, 1981, 3103500

Int. Cl.³ B29C *1/02*

U.S. Cl. 264—225 **5 Claims**

1. A process for taking an impression of an object in which a gel-forming composition is first poured over the object, the gel-forming composition is permitted to gel, and the object is subsequently removed in which the gel-forming composition comprises:

(a) a polyisocyanate; and

(b) a polyhydroxyl compound having a molecular weight between 1,000 and 12,000 and an OH number between 20 and 112

said composition being essentially free of hydroxyl compounds having a moleular weight less than 800, having an isocyanate index between 15 and 60 with the product of the isocyanate and hydroxyl functionalities being at least 5.2

4,466,937

PRODUCTION OF VENETIAN MOSAIC SURFACES

Roy G. S. Johnston, and Dennis F. Pavelin, both of Bristol, England, assignors to Wessex Mosaic Studies Ltd., Bristol, England

Filed Sep. 28, 1982, Ser. No. 425,615

Claims priority, application United Kingdom, Oct. 8, 1981, 8130478

Int. Cl.³ B28B *1/16*

U.S. Cl. 264—256 **10 Claims**

1. A method of making a venetian mosaic or terrazzo surface having a pictorial design comprising a multiplicity of areas differing in color comprising:

(i) providing a support having an upper support surface;

(ii) delimiting at least a plurality of said areas of the design on said surface by a method comprising:

(a) locating a layer of sheet material on said surface,

(b) providing on said sheet material a full-size representation of at least a first part of said pictorial design including said plurality of areas,

(c) removing portions of the sheet material adjacent the peripheries of said areas to create channels extending through said sheet material to expose the support surface, said channels extending at least partially around respective areas,

(d) casting separators onto the support surface in the channels so that the separators delimit the areas, and p2 (e) removing the sheet material from the support surface within the delimited areas;

(iii) laying respective colored layers of settable composition and aggregate over said support surface in said delimited areas;

(iv) laying a backing layer to overlie said plurality of areas; and

(v) removing the support to expose the front surface of the mosaic or terrazzo surface.

4,466,938

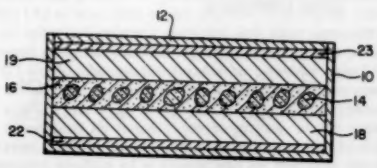
METHOD FOR REDUCING DAMAGE TO DIAMOND CRYSTALS DURING SINTERING

Paul D. Gigl, Worthington, Ohio, and Robert L. Winegardner, Grapevine, Tex., assignors to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 69,203, Aug. 23, 1979, abandoned. This application Oct. 25, 1982, Ser. No. 436,251

Int. Cl.³ C04B *35/60*

U.S. Cl. 264—332 **6 Claims**



1. An improved process for preparing a compact containing 10 to 40 mesh single crystal diamond by high pressure-high

temperature sintering at pressure temperature conditions within the diamond stable region, wherein the improvement comprises isolating the single diamond crystals in a compressible matrix before exposing the mass of diamonds to high pressure-high temperature sintering conditions, said compressible matrix being selected from the groups consisting of:

(A) a disc made of materials selected from graphite and carbide forming transition metals with compartments for holding individual diamond crystals;

(B) a pair of graphite discs between which the single diamond crystals are disposed; and

(C) a combination of (A) and (B).

4,466,939

PROCESS OF PRODUCING COPPER-ALLOY AND COPPER ALLOY PLATE USED FOR MAKING ELECTRICAL OR ELECTRONIC PARTS

Young G. Kim, Seoul, and Dong K. Park, Incheon, both of Rep. of Korea, assignors to Poong San Metal Corporation, Incheon, Rep. of Korea

Filed Sep. 22, 1983, Ser. No. 534,893

Claims priority, application Rep. of Korea, Oct. 20, 1982, 4714/82[U]

Int. Cl.³ C22C *9/06*; C22F *1/08*

U.S. Cl. 420—485 **17 Claims**

1. Copper-nickel alloys for electrical lead conductor materials for integrated circuits consisting essentially of copper and from about 0.05 to 3.0% by weight nickel, from about 0.01 to 1.0% by weight silicon, and from about 0.01 to 0.1% by weight phosphorus.

3. A method for producing an alloy consisting essentially of copper and from about 0.05 to about 3.0% by weight nickel, from about 0.01 to about 1.0% by weight silicon, from about 0.01 to about 0.1% by weight phosphorus, and optionally 0.01 to 3.0% iron for electrical lead conductor materials integrated circuits comprising as sequential steps:

(a) casting the composites of claims 1 or 2;

(b) hot rolling the casting at a temperature of between about 750° to 950° C.;

(c) rapidly cooling the rolled casting;

(d) cold rolling the casting with a reduction in size of about 60 to 80%;

(e) annealing the casting at a temperature of between about 400° C. to 520° C. for about two hours;

(f) rapidly cooling the resulting product;

(g) again cold rolling the resulting product with a reduction in size of about 50 to 70%;

(h) annealing the resulting product at a temperature of between about 400° C., to 520° C. for about two hours;

(i) rapidly cooling the resulting product;

(j) finally cold rolling the casting with a size reduction of about 50 to 70%;

(k) low temperature annealing the resulting product at a temperature of between about 250° C. to 400° C.

4,466,940

MULTICOMPONENT ALLOY FOR SPUTTERING TARGETS

G. A. Horst Siewert, Freigericht; Horst Dietrich, Biebergemund; Wolf-Dieter Munz, Freigericht, and Jorg Goebel, Alzenau-Michelbach, all of Fed. Rep. of Germany, assignors to Demetron Gesellschaftfür Electronik-Werstoffe mbh, Hanau and Leybold-Heraeus GmbH, Cologne, both of, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,612

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142541

Int. Cl.³ B32B *15/04*

U.S. Cl. 420—507 **7 Claims**

4. The new use of a multicomponent alloy, comprising:

providing the multicomponent alloy comprising, by weight, from 45% to 65% of Au, from 1% to 10% of Al, and the remaining percentage of Cu as a sputtering target.

4,466,941

PHOTOSENSITIVE COMPOSITIONS AND PRODUCTS

Anthony Cerami, Flanders, N.J., and Michael A. Yamin, New York, N.Y., assignors to Evreka, Inc., Bergenfield, N.J.

Filed Feb. 11, 1982, Ser. No. 348,113

Int. Cl.³ G01N *21/78*; C09B *11/10*

U.S. Cl. 422—57 **31 Claims**

1. A photosensitive composition for the detection of radiation in the ultraviolet wavelength range, said composition consisting essentially of a complex of a hydrophobic leuco dye and serum albumin, said leuco dye and said serum albumin are bound to each other in said complex by hydrophobic bonds.

4,466,942

GASEOUS CONTAMINANT DOSIMETER

Lockhart B. Rogers, Athens, Ga., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1982, Ser. No. 425,050

Int. Cl.³ G01N *31/00*, *31/06*

U.S. Cl. 422—61 **6 Claims**

1. A personal dosimeter for collecting a gaseous contaminant in proportion to its average ambient concentration during the collection time, the dosimeter consisting essentially of

a closed receptacle;

within the receptacle, an absorbant collecting medium for the gaseous contaminant of 0.001 to 3.0% sodium bisulfite by weight based on weight of aqueous solution and 0.001 to 2.0% sodium bicarbonate by weight based on weight of aqueous solution;

a diffusion device, forming part of the boundary of said receptacle, the device containing a plurality of through-and-through channels adapted for the gaseous contaminant to diffuse therethrough from the atmosphere to the interior of the receptacle, said channels each having a length-to-diameter ratio of at least 3 and said channels providing the only communication between the atmosphere and the interior of the receptacle; and

a porous, hydrophobic, inert film covering the interior openings of said channels.

4,466,943

FLAME PHOTOMETRIC DETECTOR ANALYZER

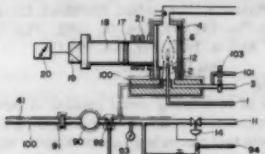
Isao Murase, and Katsutoshi Hirose, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 26, 1980, Ser. No. 210,496

Claims priority, application Japan, Nov. 28, 1979, 54-153040; Nov. 28, 1979, 54-153041; Dec. 25, 1979, 54-167633

Int. Cl.³ G01N *21/72*, *33/00*, *31/08*

U.S. Cl. 422—91 **16 Claims**



1. A flame photometric detector analyzer, comprising:

means defining and containing a source of fuel gas and including a first conduit means through which said fuel gas flows;

a fuel gas discharge nozzle connected to said first conduit

means to be supplied with the fuel gas to form a flame when ignited,

means defining and containing a source of combustion supporting gas and including a second conduit means through which said combustion supporting gas is supplied to the vicinity of the tip of said fuel gas discharge nozzle to assist the combustion of fuel gas discharged from said nozzle;

means defining and containing a source of sample gas and including a third conduit means through which said sample gas is supplied to the flame, said sample gas containing a measuring object component to be detected;

means defining and containing a source of background component gas and including a background providing means for supplying to the flame, simultaneously with the sample gas from said third conduit means said background component gas capable of emitting a characteristic light spectrum having the same wave length as that of the characteristic light spectrum of the measuring object component;

photodetector means responsive to photoemission from the mixture of said measuring object component and said background component during operation of said analyzer;

means defining and containing a source of standard gas and including a means for supplying said standard gas into the flame through said third conduit means, said standard gas having a concentration of a component and being capable of generating a dark current in said photodetector means;

means defining and containing a source of interference gas including a means for supplying said interference gas into the flame, said interference gas being capable of varying the dark current; and

means for controlling the pressure of the sample gas to be supplied through said third conduit means to the flame with reference to the variation of the dark current, to regulate the amount of the sample gas to be supplied to the flame.

4,466,944

PROCESS FOR RECOVERY OF URANIUM FROM WET PROCESS H_3PO_4

Richard S. Dennis, Lakeland, Fla., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jul. 21, 1983, Ser. No. 515,750
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—6 **2 Claims**

1. A process for separation of the ammonium salt of di(2-ethylhexyl)phosphoric acid from an aqueous solution of ammonium uranyl tricarbonate containing said salt as an impurity comprising the steps of contacting said solution with activated carbon in an amount of at least about 0.5 to 2.5 g or more per 100 ml of solution.

4,466,945

METHOD OF RECOVERING METAL CARBIDES

Richard F. Cheney, and Anil Bansal, both of Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 434,987, Oct. 18, 1982,. This application Aug. 8, 1983, Ser. No. 506,178
Int. Cl.³ C01B *31/30*
U.S. Cl. 423—53 **1 Claim**

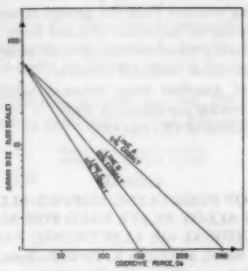
1. A method of reclaiming metal carbide in powder form from pieces of cemented metal carbide according to a desired grain size wherein said pieces have a substantially similar metal binder composition comprising determining the grain size of said pieces by measuring the coercive force of at least some of said pieces and ascertaining the grain size of said same pieces as a function of measured coercive force and metal binder content according to an approximate straight line when plotted on a Cartesian graph with the log G as the ordinate and Hc is the absicisa, where G is grain size and Hc is coercive force in oersteds according to the following equation:

$$\log G = I_1 - mHc$$

m=slope of said straight line

I_1=intercept of straight line with ordinate

separating said pieces having an ascertained grain size into a



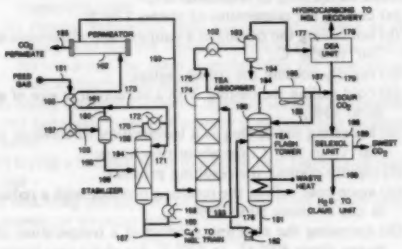
lot, treating said lot with molten zinc for a time and at a temperature to form an alloy of zinc and said matrix metal binder, and subsequently removing said alloy to form a friable powder comprising metal carbide and metal binder.

4,466,946

CO_2 REMOVAL FROM HIGH CO_2 CONTENT HYDROCARBON CONTAINING STREAMS

Clifton S. Goddin, Jr.; Edward A. Turek, both of Tulsa, Okla., and Boyd A. George, Lisle, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 12, 1982, Ser. No. 357,362
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—228 **39 Claims**



1. Process for treating a gaseous stream comprising hydrocarbons and CO_2 comprising

(a) separating a portion of hydrocarbons from the gaseous stream to produce a first stream;

(b) separating CO_2 from the first stream in a first CO_2 absorption zone by absorption in a first solution effective for CO_2 removal to produce a hydrocarbon enriched second stream;

(c) further separating CO_2 from the second stream in at least a second CO_2 absorption zone by absorption in a second solution effective for CO_2 removal to produce a further hydrocarbon enriched third stream,

wherein the gaseous stream comprises CO_2 and hydrocarbons such that in the absence of step (a) hydrocarbon condensation due to hydrocarbon dewpoint temperature increase occurs as CO_2 is removed in at least one of steps (b) and (c), and

wherein the first solution comprises an aqueous tertiary alkanolamine solution; and

the second solution comprises an aqueous alkanolamine solution selected from the group consisting of aqueous

secondary alkanolamine solutions and aqueous primary alkanolamine solutions.

4,466,947

DENITRATION CATALYST AND DENITRATING METHOD

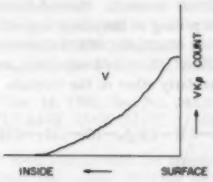
Makoto Imanari; Bunzi Oshida, both of Ami; Yusaku Arima, Fukuoka; Hirokazu Tanaka, Kitakyushu; Yoshinori Todo; Norihisa Kobayashi, both of Nagasaki, and Toshikuni Sera, Hiroshima, all of Japan, assignors to Mitsubishi Petrochemical Co. Ltd.; Catalysts & Chemicals Ind. Co. Ltd. and Mitsubishi Jukogyo Kabushiki Kaisha, all of Tokyo, Japan

Continuation of Ser. No. 267,765, May 28, 1981, abandoned. This application Jan. 7, 1983, Ser. No. 456,398

Claims priority, application Japan, May 31, 1980, 55-72170

Int. Cl.³ B01J *8/00*; C01B *21/00*

U.S. Cl. 423—239 5 Claims



1. A denitration catalyst for a waste gas containing nitrogen oxides and sulfur dioxide comprising at least three metal components, (A) titanium, (B) tungsten and/or magnesium, and (C) vanadium, the titanium and tungsten being contained as oxides and the magnesium and vanadium being contained in the form of an oxide or a sulfate or both, said catalyst being composed of a porous molded article of a mixture of an oxide of titanium as component A and at least one member of the group consisting of an oxide of tungsten, an oxide of magnesium and a sulfate of magnesium as component B, the atomic ratio of component B to component A being from 0.01 to 1, and a vanadium compound localized in that area of said molded article which extends from its outermost surface to a depth of 500 microns or less, the content of the vandium compound in said area being 0.1 to 15% by weight.

4,466,948

PROCESS FOR REMOVING HEAVY METAL IONS AND ARSENIC FROM WET-PROCESSED PHOSPHORIC ACID

Günther Schimmel, Erftstadt; Reinhard Gradl, Hürth, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellchaft, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 508,272

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227202

Int. Cl.³ C01B *25/16*; B01D *11/00*; C01G *17/00*; B03C *1/00*

U.S. Cl. 423—321 R 3 Claims

1. A process for removing heavy metals and arsenic from crude wet-process phosphoric acid, which comprises: treating the crude wet process phosphoric acid with a diorganyldithiophosphoric acid ester at temperatures within the range of 55°–75° C.; subsequently treating the thus treated phosphoric acid with a solid silicate or carbon adsorbent at a temperature within the range of 25°–40° C.; and, recovering the thus purified phosphoric acid.

4,466,949

PROCESS FOR CONTINUOUSLY PRODUCING CARBON FIBERS

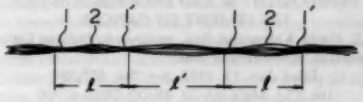
Yukiyoshi Mori, Ehime, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,583

Claims priority, application Japan, Sep. 16, 1981, 56-144603

Int. Cl.³ D01F *9/14*, *9/22*

U.S. Cl. 423—447.4 17 Claims



1. A process for continuously producing carbon fibers comprising

interconnecting the rear end of a preceding precursor fibrous yarn with the front end of a subsequent precursor fibrous yarn;

continuously oxidizing the successively interconnected precursor yarns in an active atmosphere; and

carbonizing the oxidized yarns in an inactive atmosphere,

wherein said rear end and said front end are doubled on each other so that said successive precursor yarns are connected with each other by means of a length of doubled portion and said yarns are entangled by application of fluid jet treatment at the doubled portion, said doubled portion being in a relaxed state, to integrally interconnect said successive precursor yarns, and to provide a tensile strength of said doubled and entangled portion after oxidation in an air atmosphere at about 230° to 250° C. for 200 minutes of at least 0.8 g/d.

4,466,950

PROCESS FOR RECOVERING CESIUM FROM CESIUM ALUM

Peter G. Mein, LaSalle, Ill., assignor to Carus Corporation, LaSalle, Ill.

Filed Jul. 12, 1983, Ser. No. 512,926

Int. Cl.³ C01G *45/12*

U.S. Cl. 423—599 10 Claims

1. A process for recovering cesium from cesium alum, $CsAl(SO_4)_2$, comprising:

(a) dissolving solid cesium alum in an aqueous hydroxide solution selected from the class consisting of aqueous sodium and/or potassium hydroxides, said solution having a hydroxide normality of from 0.5 to 4.0;

(b) forming cesium aluminum hydroxide, $CsAl(OH)_4$, and potassium sulfate, K_2SO_4 with part of the K_2SO_4 precipitating;

(c) separating the solids from the supernatant solution;

(d) adding a water-soluble permanganate to the supernatant solution;

(e) forming a precipitate of cesium permanganate, $CsMnO_4$; and

(f) separating the $CsMnO_4$ precipitate from the residual solution to obtain cesium permanganate of high purity.

4,466,951

INTRACELLULAR TRAPPING OF THERAPEUTICS OR TRACER AGENTS

Ray C. Pittman, Del Mar, Calif., assignor to University of California, Berkeley, Calif.

Filed Nov. 12, 1982, Ser. No. 441,275

Int. Cl.³ A61K *43/00*, *49/00*

U.S. Cl. 424—1.1 27 Claims

1. A method for intracellular trapping of a primary amine-containing therapeutic or tracer agent within a cell comprising the steps of:

binding said agent to cellobiose to form a intracellularly trappable nonmetabolizable adduct;
binding said adduct to a targeting agent to form a targeted adduct capable of introducing said adduct into said cell;
introducing said targeted adduct into said cell wherein said agent remains attached to said cellobiose and is thereby trapped within said cell.

4,466,952
COMPOSITIONS AND PROCESS FOR THE TREATMENT OF CANCER
Harry E. Hadd, Valparaiso, Ind., assignor to Indiana University Foundation, Bloomington, Ind.
Filed Jan. 12, 1983, Ser. No. 457,384
Int. Cl.³ A61K *43/00, 49/00;* **C01J** *41/00*
U.S. Cl. 424—1.1 **8 Claims**

6. A method for the destruction of cancerous tissues containing estrogen receptors comprising the steps of:
administering an effective dose of an estratriene or estratetraene composition bearing a dicarbadodecaboranyl substituent at the 17-position;
irradiating the area of the cancerous tissue with low energy thermal neutrons of about 10^{10} to about 10^{12} fluence for such a time as is necessary to bring about destruction of the cancerous cells.

4,466,953
POLYMERIC DIFFUSION MATRIX
Alec D. Keith, and Wallace Snipes, both of State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.
Continuation of Ser. No. 258,456, Apr. 28, 1981, which is a continuation of Ser. No. 109,242, Jan. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,084, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,735
Claims priority, application Japan, Aug. 14, 1979, 54-103495
Int. Cl.³ A61K *9/70;* **A61L** *15/03*
U.S. Cl. 424—28 **9 Claims**

1. A transdermal drug delivery vehicle, which contains a sedative, chosen from the group consisting of pentabarbital sodium, phenobarbital, secobarbital, sodium, codeine, (α-bromoisovaleryl)urea, carbromal and sodium phenobarbital, capable of being delivered transdermally over a prolonged period of time through the unbroken skin of a patient, in the form of a shape-retaining matrix for direct application to the skin of a patient in need of the sedative to be delivered, said matrix comprising from about 2 to about 60% glycerol, from about 2 to about 15% polyvinylalcohol molecular weight of from about 100,00 to about 150,000, from about 2 to about 10% polyvinylpyrrolidone molecular weight of from about 20,000 to about 60,000 and the balance water, cast or molded from hot solution thereof.

4,466,954
ORAL COMPOSITION
Hiromichi Ichikawa, Matsudo; Kazuo Saso, Hiratsuka, and Nobuo Suganuma, Funabashi, all of Japan, assignors to Lion Corporation, Tokyo, Japan
Filed Sep. 29, 1982, Ser. No. 427,542
Claims priority, application Japan, Dec. 29, 1981, 56-213094
Int. Cl.³ A61K *7/16, 7/28*
U.S. Cl. 424—50 **5 Claims**

1. An oral composition, comprising:
100 to 100,000 units per gram of the composition of a dextranase enzyme produced by a fungi of the genus Chaetomium; and
0.1% to 7% by weight based on the total weight of the composition of an admixture comprising water-soluble salts of alkyl sulfates having 10, 12, 14, and 16 carbon atoms in the alkyl chain in the following proportion:

C_{10}—alkyl sulfate salt	0–20%,
C_{12}—alkyl sulfate salt	50–80%,
C_{14}—alkyl sulfate salt	10–30%, and
C_{16}—alkyl sulfate salt	0–15%,

based on the weight of the admixture.

4,466,955
SKIN BLEACHING STICK CONTAINING HYDROQUINONE
Luis C. Calvo, Bayshore; Irene C. Obernier, Northport, and Steve J. Hasher, Holbrook, all of N.Y., assignors to Germaine Monteil Cosmetiques Corporation, Deer Park, N.Y.
Filed Jun. 9, 1982, Ser. No. 386,820
Int. Cl.³ A61K *7/135, 7/44*
U.S. Cl. 424—62 **8 Claims**

1. An anhydrous cosmetic blemish-bleaching solid stick composition comprising as the active ingredient an anhydrous solution consisting essentially of a tyrosine-inhibiting amount, in the range 2–10 wt. % of hydroquinone, and 40 to 45 wt.% of an alkoxylated fatty ether of the formula

$$R-(O-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2)_x-(O-CH_2-CH_2)_y-OH$$

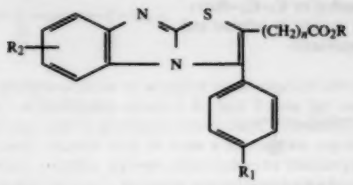
where R is a saturated or unsaturated fatty alcohol radical or lanolin alcohol radical and x and y are independent integers of 0 to about 50, with the sum of x and y ranging from at least 2 to about 70 and a non-aqueous cosmetically acceptable vehicle selected from the group consisting of fatty alcohol, oil containing an alcohol group, fat and wax.

4,466,956
METHOD OF THERAPY FOR ORAL HERPES SIMPLEX
Robert Leeds, 9425 S.W. 142 St., Miami, Fla. 33176
Continuation-in-part of Ser. No. 315,911, Oct. 28, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,489
Int. Cl.³ A61K *31/79, 33/18*
U.S. Cl. 424—80 **10 Claims**

1. The method of therapy for oral herpes simplex comprising:
application to and covering of an affected area with povidone-iodine; and
immediate application to and covering of the same area with diluted triamcinolone acetonide.

4,466,957
VACCINE ADJUVANTS
Richard N. Hjorth, King of Prussia, Pa.; Bobby O. Moore, Fort Dodge, Iowa, and Norman H. Grant, Wynnewood, Pa., assignors to American Home Products Corporation, New York, N.Y.
Filed Feb. 25, 1982, Ser. No. 352,491
Int. Cl.³ A61K *39/02, 39/12, 39/145, 39/245*
U.S. Cl. 424—89 **3 Claims**

1. A mammalian vaccine composition comprising an inactivated whole or subunit virus vaccine and an effective amount of an adjuvant having the formula



wherein R is hydrogen or 1 to 6 carbon atom lower alkyl, R_1 is hydrogen, 1 to 6 carbon atom lower alkyl, 1 to 6 carbon atom lower alkoxy, trifluoromethyl or halo, R_2 is hydrogen, chloro or nitro, n is 1 or 2 and pharmaceutically acceptable salts thereof.

4,466,958

FOOD SUPPLEMENT

Lester M. Morrison, 7012 La Presa Dr., Los Angeles, Calif. 90028

Filed Mar. 18, 1981, Ser. No. 245,023

Int. Cl.³ A61K *33/00, 31/70, 31/685*

U.S. Cl. 424—127 **9 Claims**

1. An improved food supplement for treating cardiac and circulatory difficulties containing effective amounts of phosphatidyl choline, phosphatidyl inositol and/or phosphatidyl ethanolamine, lecithin, a mucopolysaccaride, niacin and silicon dioxide, silicic acid and/or organic esters of silicic acid.

4,466,959

PREPARATION FOR UDDER CARE AND DISINFECTION FOR DAIRY ANIMALS

Georg Lauermann, Metzkausen; Siegfried Scholz, Düsseldorf, and Ferdinand Koch, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 409,780

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 3209328

Int. Cl.³ A61K *33/18, 47/00*

U.S. Cl. 424—150 **3 Claims**

1. A preparation for the disinfection of teats and the care of udders of dairy animals which comprises:

(a) from about 84.4 to 91.6 percent by weight, based upon the weight of the total preparation, of deionized water;

(b) from about 3 to 5 percent by weight, based upon the weight of the total preparation, of glycerin;

(c) from about 3 to 5 percent by weight, based upon the weight of the total preparation, of paraffin oil;

(d) from about 1 to 2.5 percent by weight, based upon the weight of the total preparation, of saturated C_{16}-C_{18}-fatty alcohols;

(e) from about 1 to 2.5 percent by weight, based upon the weight of the total preparation, of nonionic emulsifying agent; and

(f) from about 0.4 to 0.6 percent by weight, based upon the weight of the total preparation, of an iodine complex with disinfecting action,

wherein the content of active iodine is from about 800 to 1200 ppm and the viscosity is from about 25 to 35 sec. as measured at 20° C. in a Ford beaker with a 4 mm nozzle.

4,466,960

ANALGESIC-DIURETIC COMPOSITIONS

Harold I. Silverman, Framingham, Mass., and Edward L. Steinberg, Long Beach, N.Y., assignors to Thompson Medical Co., Inc., New York, N.Y.

Filed Oct. 18, 1983, Ser. No. 543,239

Int. Cl.³ A61U *31/52, 31/165, 33/02*

U.S. Cl. 424—166 **10 Claims**

1. A solid oral pharmaceutical composition comprising a mixture of active ingredients which comprises about 40–60% acetaminophen, about 5–20% caffeine, about 25–45% of a diuretic ammonium salt selected from the group consisting of ammonium acetate, ammonium citrate, ammonium nitrate, ammonium chloride and mixtures thereof; and about 0.5–5% of an antihistamine selected from the group consisting of diphenhydramine, promethazine and pyrilamine maleate.

4,466,961

COMPOSITION FOR THE TREATMENT OF EPITHELIAL INJURIES AND PROCESS FOR THE PREPARATION THEREOF

Emília Szijjártó née Auber, and Magda Ràskai, both of Budapest, Hungary, assignors to Humán Oltóanyagtermelö és Kuató Intézet, Gödöll'o, Hungary

Filed Mar. 16, 1982, Ser. No. 358,874

Claims priority, application Hungary, Mar. 17, 1981, 663/81

Int. Cl.³ A61K *31/70, 31/335, 31/235, 31/23*

U.S. Cl. 424—180 **4 Claims**

1. A process for the preparation of a composition for the treatment and post treatment of burns, for the treatment of healing surgical wounds, or of frozen skin surface, and for promoting epithelization of wounds caused by abrasion or caustic materials which comprises the steps of:

dissolving 5 to 20 mg of a tannic compound selected from the group consisting of pyrocatechol, tannic acid, gallic acid, digallic acid, catechol tannic acid, and pentadigalloyl glucose, 5 to 15 mg of a carbohydrate selected from the group consisting of glucose, fructose and xylose, 0.5 to 6 mg of a compound selected from the group consisting of quercetine, apigenine, cyanidine, cyanine, delphinin, pectin, and mixtures thereof, 0.5 to 6 mg of a wax selected from the group consisting of carnauba wax and bee wax, and 0.01 to 0.1 mg of a volatile oil selected from the group consisting of geraniol, nerol, citronelol, eugenol, linalol, and corresponding aldehydes, or mixtures thereof, in a C_2–C_4 alkanol to obtain 100 ml of composition.

4,466,962

INSECTICIDAL 1-ALKYL-5-SUBSTITUTED-4-CHLOROPYRAZOLE-3-YL-(THIO) PHOSPHATES AND (THIO) PHOSPHONATES

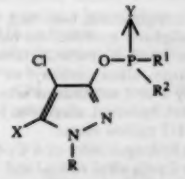
Edward I. Aoyagi, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 28, 1983, Ser. No. 470,823

Int. Cl.³ A01N *57/16;* **C07F** *9/65*

U.S. Cl. 424—200 **24 Claims**

1. A compound of the formula



wherein R is lower alkyl; R^1 is lower alkoxy; R^2 is lower alkyl or lower alkoxy; X is chloro or the group $—SR^3$ wherein R^3 is lower alkyl; and Y is sulfur or oxygen.

13. A method of killing insects which comprises contacting

said insect or its habitat with an insecticidally effective amount of a compound of the formula defined in claim 1.

4,466,963

PHARMACEUTICAL COMPOSITIONS

John F. Cavalla, Isleworth, and Roger J. Stephens, Marlow, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Jul. 5, 1983, Ser. No. 510,868

Claims priority, application United Kingdom, Jul. 8, 1982, 8219837

Int. Cl.[3] **A61K** *31/19, 31/33*

U.S. Cl. 424—244 **4 Claims**

1. A process for treating pain in a mammal which comprises administering to the mammal one part by weight of meptazinol or a pharmaceutically acceptable acid addition salt thereof and about 3 to 6 parts by weight of ibuprofen or a pharmaceutically acceptable salt thereof.

4,466,964

LIPID ABSORPTION-INHIBITING 1,4-BENZOTHIAZINES

Hans-Joachim Kabbe, Leverkusen; Hans-Peter Krause, and Rüdiger Sitt, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

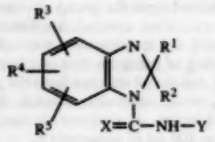
Division of Ser. No. 206,314, Oct. 31, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,829

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945238; Aug. 8, 1980, 3030024

Int. Cl.[3] **C07D** *279/16, 417/12;* **A61K** *31/54*

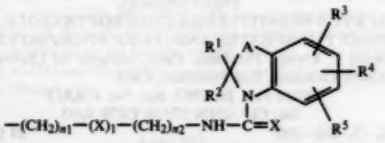
U.S. Cl. 424—246 **16 Claims**

1. A pharmaceutical composition for providing a hypolipidemic effect containing as an active ingredient a hypolipidemically effective amount of a compound which is an alkylurea of the formula



(I)

in which Y represents R or a radical



in which n_1 and n_2 are integers from 3 to 9 and l is 0 or 1 and in which

R represents a straight-chain, branched, cyclic, saturated or unsaturated aliphatic hydrocarbon radical with up to 20 carbon atoms, which is optionally substituted by halogen, hydroxyl, alkoxy, alkoxycarbonyl or phenyl, optionally substituted by 1 or 2 substituents selected from halogen, trifluoromethyl, hydroxyl, alkyl with 1–2 carbon atoms or alkoxy with 1–2 carbon atoms

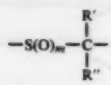
R^1 represents a hydrogen atom or a C_1–C_6 alkyl radical

R^2 represents a C_1–C_6 alkyl radical and

R^3, R^4 and R^5 are identical or different and each represent a hydrogen or halogen atom or a hydroxyl, cyano, C_1–C_6 alkyl, C_1–C_6 alkoxy, (C_1–C_6 alkoxy)-carbonyl, C_1–C_6 alkylmercapto, C_1–C_6 alkyl-sulphonyl, C_1–C_6 alkylsulphinyl, (C_1–C_6 alkyl)-carbonyl, phenyl or phenoxy, each optionally mono- or di-substituted by halogen, trifluoromethyl or C_1–C_2-alkoxy

X is oxygen or sulphur and

A represents



R′ and R″ are identical or different and each is a hydrogen atom or a C_1–C_6 alkyl radical and m is 0, 1 or 2

in admixture with an inert pharmaceutical carrier.

4,466,965

PHTHALAZINE COMPOSITIONS, COMPOSITIONS AND USE

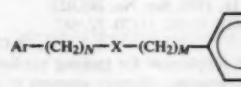
David M. Stout, Vernon Hills, and William L. Matier, Libertyville, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 26, 1982, Ser. No. 401,752

Int. Cl.[3] **A61K** *31/50, 31/535;* **C07D** *237/30, 413/12*

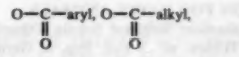
U.S. Cl. 424—250 **25 Claims**

1. A compound of the formula



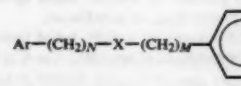
where x is

wherein R_1 is hydrogen, aryl or lower alkyl; W is hydrogen, hydroxy,



$(Y)_A$ is positioned ortho to w and is an aminoalkyl having the formula $—CH_2NR_2R_3$, wherein R_2 and R_3 are the same or different and may be hydrogen, lower alkyl, cycloalkyl, or R_2 and R_3 may together with N form a pyrrolidine, piperidine, morpholine, pyridine, pyrrole, piperazine, or thiomorpholine group, and A is 1 or 2; N and M are independently from 0 to about 5; and Ar is a substituted or unsubstituted phthalazine or a pharmaceutically acceptable salt thereof.

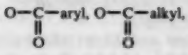
12. A cardiac arrhythmic composition containing an antiarrhythmic-effective amount of the compound having the formula



where x is

wherein R_1 is hydrogen, aryl or lower alkyl

W is hydrogen, hydroxy,



$(Y)_A$ is positioned ortho to w and is an aminoalkyl having the formula $—CH_2NR_2R_3$, wherein R_2 and R_3 are the same or different and may be hydrogen, lower alkyl, cycloalkyl, or R_2 and R_3 may together with N form a pyrrolidine, piperidene, morpholine, pyridine, pyrrole, piperaxzine, or thiomorpholine group, and A is 1 or 2; N and M are independently from 0 to about 5; and Ar is a substituted or unsubstituted pathalazine; and the pharmaceutically acceptable salts thereof in admixture with a pharmaceutically acceptable carrier or diluent.

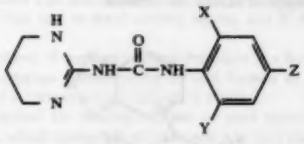
4,466,966

N-ARYL-N'-(1,4,5,6-TETRAHYDROPYRIMIDIN-2-YL)UREAS FOR INTESTINAL DISORDERS

Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, D.C.

Filed Jun. 16, 1980, Ser. No. 159,986
Int. Cl.³ A61K *31/505*; C07D *239/02*
U.S. Cl. 424—251 **12 Claims**

1. A method for relieving the symptoms associated with irritable bowel syndrome which comprises administering to an animal having said syndrome a therapeutically-effective amount of a urea compound selected from the group consisting of (a) an N-(phenyl)-N'-(1,4,5,6-tetrahydropyrimidin-2-yl)urea, having the formula:



wherein Z is H or F; X and Y are each independently selected from the group consisting of Br, Cl, F, CH_3, CF_3, and OCH_3; and (b) a pharmaceutically-acceptable salt thereof.

4,466,967

ARTHROPOD REPELLENTS

Joel R. Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 90,156, Oct. 31, 1979, Pat. No. 4,419,360. This application Jul. 26, 1982, Ser. No. 402,182
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.³ A01H *43/42*
U.S. Cl. 424—258 **4 Claims**

1. A method for repelling arthropods which comprises applying an effective repellent amount of N-propyl 1,2,3,4-tetrahydroquinolyl urea.

2. A method for repelling arthropods which comprises applying an effective repellent amount of N-butyl 1,2,3,4-tetrahydroisoquinolyl urea.

3. A method for repelling arthropods which comprises applying an effective repellent amount of N-propyl 1,2,3,4-tetrahydroisoquinolyl urea.

4. A method for repelling arthropods which comprises applying an effective repellent amount of N-ethyl 1,2,3,4-tetrahydroquinolyl urea.

4,466,968

METHOD FOR PROPHYLAXIS OR TREATMENT OF EMESIS AND NAUSEA

Joel E. Bernstein, Deerfield, Ill., assignor to Dermall, Ltd., Northbrook, Ill.

Continuation-in-part of Ser. No. 209,398, Nov. 24, 1980, abandoned. This application Oct. 9, 1981, Ser. No. 310,103
Int. Cl.³ A61K *31/485*
U.S. Cl. 424—260 **9 Claims**

1. A method for prophylaxis or treatment of emesis and nausea associated with viral or bacterial gastroenteritis or cancer chemotherapy or high dose oral antibiotics or acute alcohol ingestion in human patients in need of such prophylaxis or treatment comprising administering a therapeutically effective amount of naloxone or n-methyl cyclopropyl naloxone or their pharmaceutically acceptable salts to said patients.

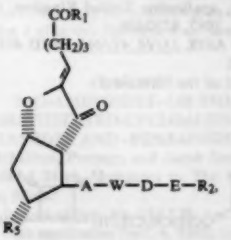
4,466,969

7-OXOPROSTACYCLIN DERIVATIVES AND THEIR USE AS HYPOTENSIVES AND BRONCHODILATORS

Robert C. Nikolson; Helmut Vorbrüggen; Jorge Casals-Stenzel, and Gerda Mannesmann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/EP81/00148, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/01002, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 17, 1981, Ser. No. 385,414
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035454
Int. Cl.³ A61K *31/557*; C07D *307/935*
U.S. Cl. 424—263 **29 Claims**

1. A 7-oxoprostacyclin derivative of the formula



(I)

in which

R_1 represents the radical OR_3 wherein

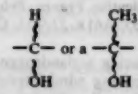
R_3 represents a hydrogen atom, a heterocyclic, aryl,cycloalkyl or $(C_1–C_{10})$alkyl radical said alkyl radical which is optionally substituted by one or more of the same or different substituents selected from halogen atoms and phenyl, $(C_1–C_4)$alkoxy and $C_1–C_4$-dialkylamino radicals, wherein the aryl radical contains 6–10 carbon atoms, wherein the cycloalkyl radical contains 4–10 carbon atoms and

wherein the heterocyclic radical is aromatic and of 5- or 6-ring atoms containing a hetero atom which is O, N or S; or the radical NHR_4 wherein

R_4 represents a hydrogen atom or a $(C_1–C_{10})$alkanoyl or alkanesulphonyl radical,

A represents a $—CH_2—CH_2—$, cis—CH=CH— or trans—CH=CH— group,

W represents a



group in which, in each case, the OH group may be esterified by a benzoyl or (C_1–C_4)alkanoic acid radical or etherified by a tetrahydropyranyl, tetrahydrofuranyl, alkoxyalkyl or trialkylsilyl radical, and wherein the free or esterified hydroxy group may be in the α- or β-position,

D and E together represent a direct bond, or

D represents a straight-chain or branched-chain (C_1–C_5)alkylene radical,

E represents an oxygen atom or a direct bond,

R_2 represents a straight-chain or branched-chain (C_1–C_6)-fluoroalkyl radical, a straight-chain or branched-chain (C_2–C_6)alkenyl radical which is optionally substituted by one or more of the same or different substituents selected from phenyl groups, halogen atoms and (C_1–C_4)alkyl radicals, and, if D and E together represent a direct bond, may also represent a (C_2–C_6)alkynyl radical which is optionally substituted in the 1-position by one or more halogen atoms or (C_1–C_4)alkyl radicals,

R_5 represents a hydroxy group that may be esterified by a (C_1–C_4)alkanoic acid radical or etherified by a tetrahydropyranyl, tetrahydrofuranyl, alkoxyalkyl or trialkylsilyl radical.

29. A method of treating a human or animal body which comprises administering a hypotensive or bronchodilatory effective amount of a compound of claim **1** or a physiologically tolerable salt thereof or a pharmaceutical preparation containing said compound in a dosage range from 1 to 1500 μg/kg/day to a human or an animal.

4,466,970
DIOXOCYCLOBUTENE COMPOUNDS

Thomas H. Brown, Tewin, and Rodney C. Young, Hertford, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

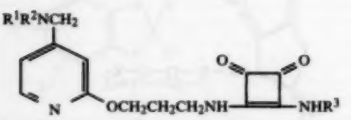
Filed Sep. 26, 1983, Ser. No. 535,467

Claims priority, application United Kingdom, Oct. 2, 1982, 8228207; Nov. 13, 1982, 8232468

Int. Cl.[3] **A61K** *31/44, 41/445;* **C07D** *401/12*

U.S. Cl. 424—263 **8 Claims**

1. A compound of the formula (I):



or a pharmaceutically acceptable salt thereof, wherein

R^1 and R^2 are independently hydrogen or C_{1-6} alkyl, or R^1R^2N represents 2,2,2,-trifluoroethylamino; or

R^1 and R^2 form a $-(CH_2)_n-$ linkage, wherein n is 4–6, so that together with the nitrogen atom to which they are attached they form a 5–7 membered ring; and

R^3 is hydrogen or C_{1-6} alkyl.

8. A method of blocking histamine H_2-receptors which comprises administering to an animal an effective amount to block said receptors of a compound of claim **1**.

4,466,971
CERTAIN DECAHYDRO-7H-BENZ(E)-INDEN-7-ONES, COMPOSITIONS CONTAINING SAME AND METHOD OF USE

Marie-Madeleine Bouton; Jean Jacques, both of Paris, and André Pierdet, Noisy-le-Sec, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 19, 1982, Ser. No. 350,151

Claims priority, application France, Feb. 23, 1981, 81 03520

Int. Cl.[3] **C07D** *213/55;* **A61K** *31/455;* **C07C** *69/14, 49/38*

U.S. Cl. 424—266 **6 Claims**

2. A method of inducing antiandrogenic activity in warm-blooded animals comprising administering to warm-blooded animals an antiandrogenically effective amount of one compound selected from the group consisting of 3aβ,6-diethyl-1,2,3,3a,4,5,8,9,9a,9b-decahydro-7H-benz(e)-inden-3β-ol-7-one, 3aβ-methyl-3-acetoxy-6-ethyl-1,2,3,3a,4,5,8,9,9a,9b-decahydro-7H-benz(e)-inden-7-one and 3β-(pyridin-3-yl)-carbonyloxy-3aβ-methyl-6-ethyl-1,2,3,3a,4,5,8,9,9a,9b-decahydro-7H-benz(e)-inden-7-one.

3. A compound selected from the group consisting of 3aβ,6-diethyl-1,2,3,3a,4,5,8,9,9a,9b-decahydro-7H-benz(e)-inden-3β-ol-7-one, 3aβ,methyl-3β-acetoxy-6-ethyl-1,2.3.3a.4.5.8,9,-9a,9b-decahydro-7H-benz(e)-inden-7-one and 3β-(pyridin-3-yl)-carbonyloxy-3aβ-methyl-6-ethyl-1,2,3,3a,4,5,8,9,9a,9b-decahydro-7H-benz(e)-inden-7-one.

4,466,972
BENZOXADIAZOLES AND BENZOTHIADIAZOLES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

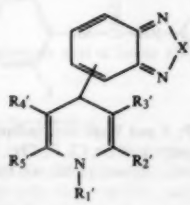
Continuation of Ser. No. 173,305, Jul. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 101,591, Dec. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 915,858, Jun. 15, 1978, abandoned. This application Mar. 19, 1982, Ser. No. 359,751

Claims priority, application Switzerland, Jun. 20, 1977, 7520/77; Mar. 16, 1978, 2865/78; Jun. 15, 1978, 5627/79; Dec. 18, 1978, 12835/78; Dec. 18, 1978, 12888/78; Dec. 18, 1978, 12890/78; Apr. 11, 1979, 3472/79; Apr. 11, 1979, 3477/79; United Kingdom, Nov. 23, 1979, 40624/79; Fed. Rep. of Germany, Dec. 8, 1979, 294945

Int. Cl.[3] **C07D** *513/00;* **A61K** *31/44*

U.S. Cl. 424—266 **34 Claims**

1. A compound having the formula

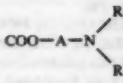


wherein

R_1' is hydrogen or C_{1-6} alkyl;

R_2' and R_5', independently, are hydrogen or C_{1-6} alkyl;

R_3' and R_4', independently, are $COOR_7'$ or



;

each

R_7', independently, is C_{1-6} alkyl, C_{3-7}-cycloalkyl, C_{7-10} phenylalkyl or C_{3-6} alkoxyalkyl;

A is C_{1-6} alkylene;

each

R_8' and R_9', independently, is C_{1-6} alkyl or C_{7-10} phenylalkyl; and

X is oxygen or sulphur,

or a pharmaceutically acceptable acid addition salt of a basic compound of the above formula.

29. The compound of claim **1** which is 4-(2,1,3-benzoxadiazole-4-yl)-2,6-dimethyl-1,4-dihydro-3-phenethyloxycarbonyl-pyridine-5-carboxylic acid methyl ester.

4,466,973

METHOD OF TREATING NASAL AND SINUS CONGESTION

Thomas Rennie, Blackberry La., Bennington, Vt. 05201

Filed Feb. 1, 1983, Ser. No. 463,062
Int. Cl.[3] A61K *31/165, 31/245, 31/445*
U.S. Cl. 424—267 4 Claims

1. A method of treating nasal congestion, sinus congestion, dysophthia, and excessive lacrimation comprising applying an effective amount of a topical anesthetic to the palatal mucosa of a subject suffering therefrom.

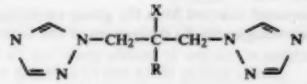
4,466,974

BISTRIAZOLE ANTIFUNGAL AGENTS

Kenneth Richardson, Canterbury, and Kelvin Cooper, Ramsgate, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,267
Claims priority, application United Kingdom, Nov. 16, 1982, 8232705
Int. Cl.[3] A01N *43/64, 47/12;* A61K *31/41;* C07D *249/08*
U.S. Cl. 424—269 9 Claims

1. A compound having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein X is selected from the group consisting of amino, dialkylamino wherein said alkyl contains from one to three carbon atoms and alkoxycarbonylamino wherein said alkoxy contains from one to three carbon atoms; and R is dichlorophenyl.

7. A method of treating a fungal infection in a human being, which comprises administering to said human an antifungal amount of a compound as claimed in claim 1.

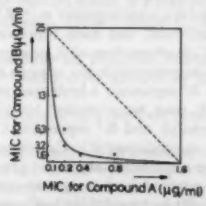
9. A method for treating a plant or seed having a fungal infection, which comprises administering to said plant or seed an antifungal amount of a compound as claimed in claim 1.

4,466,975

MICROBICIDAL/MICROBISTATIC COMPOSITIONS FOR INDUSTRIAL USE

Masato Magami; Toshio Sato, both of Nakatsu; Sakae Katayama, Kobe, and Osamu Umekawa, Kaizuka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd. and Katayama Chemical Works Co., Ltd., both of Osaka, Japan

Filed Apr. 2, 1982, Ser. No. 364,978
Claims priority, application Japan, Apr. 8, 1981, 56-53652
Int. Cl.[3] A01N *43/78, 43/80;* D21H *5/22;* C09D *5/16*
U.S. Cl. 424—270 5 Claims



1. A microbicidal composition for industrial use comprising 4,5-dichloro-1,2-dithiol-3-one and 1,2-benzisothiazolin-3-one; the weight ratio of 4,5-dichloro-1,2-dithiol-3-one to the 1,2-benzisothiazolin-3-one being 8:1–1:128.

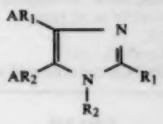
4,466,976

ANTIINFLAMMATORY AND ANTIALLERGIC IMIDAZOLE DERIVATIVES

Walter Klose, Berlin, Fed. Rep. of Germany, and Irmgard Boettcher, Basel, Switzerland, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 434,036
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3141063
Int. Cl.[3] A61K *31/415;* C07D *487/04, 403/04*
U.S. Cl. 424—273 R 37 Claims

1. An imidazole derivative of the formula



wherein

AR_1 and AR_2 each independently is phenyl, or phenyl substituted by halogen, C_{1-4}-alkyl, or C_{1-4}-alkoxy,

R_1 is pyrrolyl, indolyl, or imidazolyl, or one of these groups substituted by C_{1-6}-alkyl, carboxy, carboxy-C_{1-4}-alkyl, benzyl, or benzenesulfonyl, wherein any carboxy group can be esterified by a C_{1-6}-alkyl moiety, and wherein the point of attachment of the R_1 group to the imidazole ring is a C-atom; and

R_2 is hydrogen, C_{1-6}-alkyl, or halo-C_{1-6}-alkyl,

or a physiologically acceptable salt thereof with an acid, or, when R_1 is substituted by carboxy, a physiologically acceptable salt thereof with a base.

34. A method of treating inflammation in a patient in need of such treatment comprising administering an amount of a compound of claim 1 effective for such treatment.

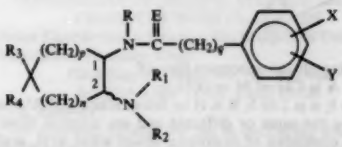
4,466,977

N-[2-AMINO(OXY- OR THIA-GROUP-SUBSTITUTED-CYCLOALIPHATIC)]BENZENEACETAMIDES AND -BENZAMIDE ANALGESICS

Moses W. McMillan, Portage, and Jacob Szmuszkovicz, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 252,535, Apr. 9, 1981, Pat. No. 4,360,531. This application Nov. 4, 1982, Ser. No. 439,103
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.[3] C07D *207/08;* A61K *31/40*
U.S. Cl. 424—274 8 Claims

1. A compound of the formula


(II)

wherein

p and n are each full number integers of from 1 to 3, so that the resulting cycloaliphatic ring has five to seven carbon atoms; the wavy line bond (~) between the nitrogen in the 2-position and the cycloaliphatic ring carbon indicates the bond can be either cis- or trans- with respect to each substituent on the cycloaliphatic ring;

q is 0 or 1;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, nitro, methoxy, hydroxy,

azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, amino, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy, C_1 to C_3-carboxacylamino [(—NHC(O)R_6];
R is hydrogen or C_1 to C_3-alkyl;
R_1 and R_2, taken separately, are hydrogen, C_1 to C_3-alkyl, allyl; or
R_1 and R_2, taken together with the nitrogen to which they are bonded, complete a ring selected from the group consisting of azetidinyl, pyrrolidinyl, and piperidinyl;
R_3, taken separately, is hydrogen, and
R_4, taken separately, is mercapto(SH), —S—(C_1–C_3-alkyl), or
R_3 is —GR_5 and R_4 is —GR_5;
wherein E is bivalent sulfur or oxygen;
each G is bivalent sulfur or oxygen;
R_5 is C_1 to C_2-alkyl;
R_6 is H or C_1 to C_2-alkyl;
or a pharmacologically acceptable acid addition salt thereof.

4,466,978

BODYWEIGHT REDUCING METHOD

Graham J. Naylor, Luigate, Lucklawhill Balmullo, St. Andrews, KY16 OBQ, Fife, Scotland, assignor to Graham John Naylor and Pamela Hilda Naylor, both of St. Andrews, Scotland

Filed Mar. 2, 1982, Ser. No. 354,016
Claims priority, application United Kingdom, Dec. 10, 1981, 8137294
Int. Cl.³ A61K *31/365, 31/54, 31/16*
U.S. Cl. 424—280 **6 Claims**

1. A method for bodyweight reduction of animals comprising administering to an animal in need of bodyweight reduction a bodyweight reducing effective dosage of 250 mg to 100 g per day of ascorbic acid or a physiologically acceptable salt and ester thereof.

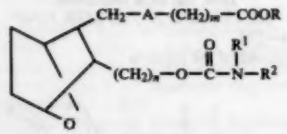
4,466,979

7-OXABICYCLOHEPTANE SUBSTITUTED CARBAMATE PROSTAGLANDIN ANALOGS USEFUL IN TREATING PLATELET AGGREGATION AND BRONCHOCONSTRICTION

Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 21, 1983, Ser. No. 459,847
Int. Cl.³ A61K *31/34, 31/557*; C07D *307/00*
U.S. Cl. 424—285 **12 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;
wherein A is CH=CH or $(CH_2)_2$;
m is 1 to 8; n is 1 to 5; R is H or lower alkyl; and R^1 and R^2 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, aryl, aralkyl, lower alkoxy, aralkoxy or cycloalkyl with the proviso that at least one of R^1 and R^2 is other than hydrogen, wherein the term "alkyl" used alone or as part of another group contains from 1 to 12 carbons and which may be unsubstituted or include a halo-substituent, an alkoxy substituent, an aryl substituent, an alkyl-aryl substituent, a haloaryl substituent, a cycloalkyl substituent or an alkylcycloalkyl substituent, the term "aryl" used alone or as part of another group refers to monocyclic or bicyclic aromatic groups containing 6 to 10 carbons in the ring portion and which may be unsubstituted or be substituted with lower alkyl, halogen or lower alkoxy, and the term "cycloalkyl" used alone or as part of another group includes saturated cyclic hydrocarbon groups containing 3 to 12 carbons and which may be unsubstituted or be substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or lower alkoxy groups.

7. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

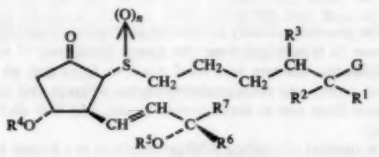
4,466,980

THIAPROSTAGLANDIN E_1 DERIVATIVES, PROCESS FOR PRODUCTION THEREOF, AND PHARMACEUTICAL USE THEREOF

Toshio Tanaka, Hino; Takeshi Toru, Hachioji; Takeo Oba, Hino; Noriaki Okamura, Chofu; Kenzo Watanabe, Hino; Kiyoshi Bannai, Hino; Atsuo Hazato, Hino; Seizi Kurozumi, Kokubunji; Fukuyoshi Kamimoto, Hino, and Akira Ohtsu, Ohme, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 30, 1981, Ser. No. 316,902
Claims priority, application Japan, Oct. 31, 1980, 55-152214; Dec. 26, 1980, 55-183727; Apr. 6, 1981, 56-50491
Int. Cl.³ C07C *177/00*; A61K *31/557*
U.S. Cl. 424—305 **14 Claims**

1. A compound selected from the group consisting of
(a) 7-thiaprostaglandin E_1 derivatives of the following formula



wherein G represents —$COOR^8$, —$CONR^9R^{10}$ or —CH_2OR^{11} in which R^8 represents a hydrogen atom, C_1–C_{10} alkyl, substituted or unsubstituted phenyl, substituted or unsubstituted (C_5–C_8) alicyclic, substituted or unsubstituted phenyl (C_1–C_2)alkyl, or one equivalent of a cation, R^9 and R^{10} are identical or different and each represents a hydrogen atom, C_1–C_{10} alkyl, substituted or unsubstituted alicyclic, substituted or unsubstituted phenyl or substituted or unsubstituted phenyl (C_1–C_2)alkyl, or R^9 and R^{10}, taken together with the nitrogen atom to which they are bonded, form a substituted or unsubstituted 5- or 6-membered ring which may contain a further hetero atom selected from nitrogen, sulfur and oxygen atoms, and R^{11} represents a hydrogen atom, C_1–C_6 alkyl, substituted or unsubstituted C_2–C_7 carboacyl, tri(C_1–C_6) hydrocarbonsilyl, or a group forming an acetal group together with the oxygen atom of the hydroxyl group; R^1 and R^2 are identical or different, and each represents a hydrogen atom, a halogen atom, methyl, or ethyl; R^3 represents a hydrogen atom or may form a bond together with R^1; R^4 and R^5 are identical or different, and each represents a hydrogen atom, tri(C_1–C_6)hydrocarbon-silyl, or a group forming an acetal linkage together with the oxygen atom of the hydroxyl group; R^6 represents a hydrogen atom, methyl, or ethynyl which may be protected by trimethylsilyl or t-butyldimethylsilyl; and R^7 represents C_5–C_8 alkyl, or substituted or unsubstituted (C_5–C_6) alicyclic; n is zero, 1 or 2, the above-mentioned substituted groups having 1 to 3 substituents selected from the group consisting of (1) a halogen atom, (2) hydroxyl, (3) C_2–C_7 carboacyloxy, (4) C_1–C_4 alkyl which is unsubstituted or substituted by a halogen atom, (5) C_1–C_4 alkoxy which is unsubstituted or substituted by a halogen atom, (6) nitrile, (7) carboxyl, and (8) (C_1–C_6) alkoxycarbonyl,

(b) the 15-epimers of said 7-thiaprostaglandin E_1 derivatives,
(c) the enantiomers of said 7-thiaprostaglandin E_1 derivatives or their 15-epimers, and (d) mixtures of these compounds.

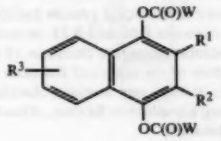
4,466,981

NAPHTHALENE ANTI-PSORIATIC AGENTS

Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco, and John M. Young, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 27, 1982, Ser. No. 437,063
Int. Cl.³ A61K *31/22, 31/275, 31/415, 31/44, 31/505;* **C07C** *69/035, 121/75;* **C07D** *213/55*
U.S. Cl. 424—311 **22 Claims**

12. A method of treating psoriasis in mammals which comprises applying an effective amount of a compound of the formula



(I)

wherein:
R^1 and R^2 are lower alkoxy of one to six carbon atoms or lower alkylthio of one to six carbon atoms;
R^3 is hydrogen, lower alkyl of one to six carbon atoms, lower alkoxy of one to six carbon atoms, phenyl optionally substituted by one or more lower alkyl, lower alkoxy, halo, lower acyl, lower acyloxy, cyano, nitro or lower acylamino, phenyl lower alkyl optionally substituted by one or more lower alkyl, lower alkoxy, halo, lower acyl, lower acyloxy, cyano, nitro or lower acylamino, phenyl lower alkoxy optionally substituted by one or more lower alkyl, lower alkoxy, halo, lower acyl, lower acyloxy, cyano, nitro or lower acylamino, amino, lower alkylamino, lower dialkylamino, halo, cyano, or $S(O)_nR$ wherein R is lower alkyl of one to six carbon atoms; phenyl optionally substituted by one or more lower alkyl, lower alkoxy, halo, lower acyl, lower acyloxy, cyano, nitro or lower acylamino; phenyl lower alkyl optionally substituted by one or more lower alkyl, lower alkoxy, halo, lower acyl, lower acyloxy, cyano, nitro or lower acylamino; or heterocyclic aryl selected from the group consisting of thiapyranyl, benzothiapyranyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, pyridinyl, pyrimidinyl, indolyl, quinolinyl and indazolyl wherein the heterocyclic aryl is optionally substituted by one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, halo and cyano and the pharmaceutically acceptable acid addition salts thereof; and n is 0, 1 or 2; and
W is alkyl of one to seven carbon atoms.

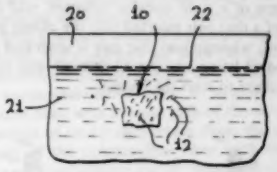
4,466,982

METHOD OF PREPARING A FISH FOOD PRODUCT

Randall A. McDonald, 21847 Lanark St. #30, Canoga Park, Calif. 91304

Filed May 26, 1981, Ser. No. 266,825
Int. Cl.³ A23B *4/10;* **A23L** *3/36;* **A23K** *1/18*
U.S. Cl. 426—1 **1 Claim**

1. A method of preparing a fish food product comprising the steps of:
preparing an ingredient which is attractive to and consumbable by a variety of fish by cutting or chopping one beefheart into several cups of cut or chopped beefheart;
adding said prepared beefheart ingredient to a quantity of water;
combining said added beefheart and water with unflavored gelatin by blending with at least one third more water;
blending hot water with said combined beefheart and gelatin combination to thoroughly dissolve the gelatin in said combination;
straining said beefheart and dissolved gelatin to remove any remaining gristle therefrom;
pouring said strained beefheart and gelatin into a plurality of storage cavities in a tray each of said storage cavities contains a predetermined quantity of water; and



freezing said beefheart ingredient, gelatin and water stored in said tray to form frozen cubes; and
introducing said frozen cubes to a water medium containing fish to melt the frozen cubes to controllably release the beefheart ingredient into the water medium for fish consumption.

4,466,983

SUBSTANTIALLY NON-AQUEOUS SEMI-LIQUID CENTER-FILL

Ralph Cifrese, Morristown; Mario W. Medri, Short Hills, both of N.J., and Leonard P. Abbazia, Brooklyn, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 4, 1983, Ser. No. 463,755
Int. Cl.³ A23G *3/30, 3/00*
U.S. Cl. 426—5 **13 Claims**

1. A center-filled, chewing gum composition having an outer shell enclosing a cavity, and a sugarless, semi-liquid center-fill within said cavity, said semi-liquid center-fill comprising:
(a) about 30 to about 50% hydrogenated starch hydrolysate;
(b) about 30 to 50% sorbitol solution;
(c) about 20 to about 40% glycerin;
(d) optionally a flavor in a sufficient amount to impart its taste;
wherein the total water content of the semi-liquid center-fill is less than about 5%, the percents being based on the weight of the semi-liquid center-fill.

4,466,984

ARTICLE FOR USE IN AUTOMATICALLY AND CONTINUOUSLY MAKING STUFFED CASING PRODUCTS WITH FLAT ENDS

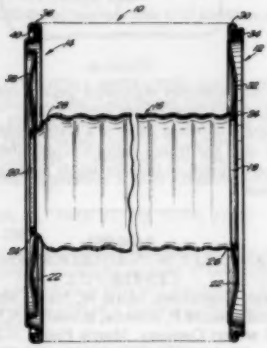
Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 430,442
Int. Cl.³ A22C *11/02;* **F16L** *11/00*
U.S. Cl. 426—105 **37 Claims**

1. An extender module for use in producing stuffed casing products having flat ends, said module comprising:
(a) a pair of annular discs, each with an opening therethrough, each being of a size sufficient to fit within a casing to be stuffed and each having a substantially flat surface to flatten one end of a stuffed casing product made with said casing; and
(b) a flexible tubular membrane extending between and connecting said discs, said tubular membrane having its ends connected to each annular disc about the opening through said discs.

29. An encased food product, having closed leading and trailing ends including a substantially flat disc implanted in

each of said ends, a closure means for closing each end of the casing of said product over each of said discs, the disc at said trailing end having an opening therethrough, and a flexible tubular membrane having one end connected to said disc at said trailing end about said opening, the other end of said flexible tubular membrane being closed together with the casing by said closure means at the trailing end, and the outer periphery of both discs being in contact with the inner periphery of the casing whereby said encased food product has generally the shape of a right circular cylinder, said discs being components of a disc pair inserted into the casing prior to the stuffing thereof, wherein said disc pair is separated responsive to a food product being introduced through said opening and between said discs to stuff the casing.



32. An article for the production of a casing stuffed product having flat ends, said article consisting essentially of:

(a) a length of casing to be stuffed, said casing length having a closed end and an open end;

(b) a pair of substantially flat members one of which is a leading member and the other of which is a trailing member arranged in a face-to-face relationship and disposed in said casing proximal to the closed end thereof with said leading member towards said closed end, the outer perimeter of said members being approximately the same length as the inner perimeter of said casing when stuffed, at least said trailing member having an opening therein to permit the introduction of a product to be stuffed between said face-to-face members.

4,466,985

METHOD FOR PREPARING CANNED, RETORTED PASTA PRODUCTS

Cho C. Tsen, Manhattan, Kans., and Karl B. Adams, Redlands, Calif., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Mar. 25, 1982, Ser. No. 361,894

Int. Cl.³ A21D *2/00*; A23L *1/16*

U.S. Cl. 426—131 **10 Claims**

1. A process for preparing a canned, retorted pasta product, comprising the steps of:

preparing said pasta product by admixing a wheat-derived material, water, from about 2 to 15.5% by weight of glycinin, and from about 0.2 to 2% by weight of surfactant taken from the group consisting of sodium and calcium stearoyl-2-lactylate to yield a dough, and forming said dough into a desired shape;

canning said pasta product; and

retorting said canned pasta product at elevated temperatures and pressures for a sufficient period of time for cooking the product.

4,466,986

PROCESS FOR THE PRODUCTION OF A FLAVORING AGENT

Max Guggenbuehler, Hagenbuch, and Sven Heyland, Warth, both of Switzerland, assignors to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 207,662, Nov. 17, 1980, abandoned. This application Oct. 18, 1982, Ser. No. 435,075

Claims priority, application Switzerland, Dec. 7, 1979, 10851/79

Int. Cl.³ A23L *1/226, 1/231*

U.S. Cl. 426—533 **14 Claims**

1. A process for the production of a flavouring agent resembling in taste meat, fish or mushrooms which comprises:

subjecting a liquid protein hydrolysate having a dry matter content of between 40 and 50% by weight to fractionation on a column of granular active carbon at a throughput corresponding to between 0.75 and 2 times the volume of the column per hour;

collecting fractions of the liquid protein hydrolysate having an extinction between 0.02 and 0.15, as measured at 525 nm in 45% solution through a thickness of 1 cm;

preparing a mixture of the collected fractions and additives which include at least one monosaccharide and, except when producing a mushroom flavour, at least one sulphur-containing substance;

reacting the mixture by heating;

removing an aromatic fraction from the reacted mixture prior to concentration;

concentrating and drying the reacted mixture; and

returning at least part of the removed aromatic fraction to the dried product.

4,466,987

PROCESS FOR PREPARING LOW-FAT NUTS

Howard Wilkins, Brookfield, and Peter M. Gannis, Stamford, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Sep. 22, 1983, Ser. No. 534,677

Int. Cl.³ A23L *1/36*

U.S. Cl. 426—632 **10 Claims**

1. A process for preparing reduced calorie roasted nuts while reducing the loss of natural roasted flavor, which comprises: roasting nuts at a moisture content and temperature, and for a time, effective to develop a roasted nut flavor and color and to obtain a uniform roasted moisture content within the range of from 3.5 to 8% based on the weight of the nuts; pressing the nuts under conditions effective to remove from about 20 to about 60% of the oil content of the nuts; hydrating the nuts to a moisture content sufficient to cause the nuts to regain approximately their normal shape during a final roasting step; and roasting the nuts to fully develop the flavor and color thereof.

4,466,988

EDIBLE PROTEIN CONTAINING SUBSTANCES

Peter J. Towersey, Wycombe; John Longton, Berkhamsted, and Geoffrey N. Cockram, Exeter, all of England, assignors to Ranks Hovis McDougall Limited, London, England

Continuation-in-part of Ser. No. 584,451, Jun. 6, 1975, abandoned, and Ser. No. 507,123, Sep. 18, 1974, Pat. No. 4,041,189, said Ser. No. 584,451, is a continuation of Ser. No. 440,775, Feb. 8, 1974, Pat. No. 3,937,693. This application Jun. 22, 1977, Ser. No. 809,018

Claims priority, application United Kingdom, Sep. 24, 1973, 44708/73; Oct. 8, 1975, 7087/75

The portion of the term of this patent subsequent to Mar. 9, 1994, has been disclaimed.

Int. Cl.³ A23J *1/18*

U.S. Cl. 426—656 **6 Claims**

1. An edible protein-containing substance comprising a non-viable edible non-toxic fungal mycelium of a non-toxic strain of

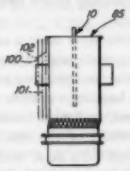
Fusarium possessing a reduced level of RNA of below 2%, and being further characterized by improved ease of processing to a form suitable for food use and an essentially white color such to make the protein-containing substance compatible with food use and a filamentous structure.

4,466,989

HORIZONTAL MOBILITY IN FLUIDIZED BEDS

Albert H. Haller, Dunwoody, Ga., and Eckart F. Schutz, Richmond, Va., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 25, 1983, Ser. No. 497,989
Int. Cl.³ B05D *1/22*; B05C *19/02*
U.S. Cl. 427—185 **12 Claims**



7. A method of coating at least one surface of an article with particles, comprising:

forming a fluidized bed in an assembly supported on a base, said forming including distributing a gas and supporting a bed of particles made fluid-like by gas diffusing therethrough and into a work chamber;

introducing the article into the work chamber having sidewalls made sufficiently strong to uniformly distribute substantially horizontal, vibratory forces over said sidewalls;

vibrating at least one pair of opposing sidewalls by applying substantially horizontal forces against such sidewalls and gases therebetween; and

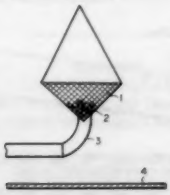
supporting the sidewalls in an isolated manner at supports from and connections to the bed assembly sufficiently that the horizontal forces are substantially contained in and uniformly distributed over the pair of sidewalls and gases therebetween, thereby imparting horizontal mobility to gas-borne particles in the chamber.

4,466,990

HEAT-RESISTANT FIBER AND/OR FIRE RETARDANT SYNTHETIC FIBER

Ichiro Sakurada, Kyoto; Kanako Kaji, Osaka, and Toshio Okada, Kadoma, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 136,948, Apr. 3, 1980, abandoned. This application Apr. 12, 1982, Ser. No. 367,476
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—35 **14 Claims**



1. A process for preparing a heat resistant and/or fire retardant synthetic fiber comprising contacting a polyethylene fiber with a mixture comprising acrylic acid, water, ethylene dichloride and a salt selected from the group consisting of ferrous ammonium sulfate, copper sulfate and cuprous chloride, and irradiating said polyethylene fiber with an ionizing radiation at a temperature of 40° to 80° C. to graft polymerize said polyethylene fiber with at least 15% of the acrylic acid based on the weight of said polyethylene fiber, the combination of the contacting of the polyethylene fiber with the acrylic acid mixture and its irradiation with the ionizing radiation at said temperature being effective to confer heat resistance and/or fire retardation to the fiber.

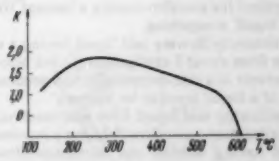
2. A process for preparing a heat resistant and/or fire retardant synthetic fiber comprising irradiating a polyethylene fiber with an ionizing radiation and then contacting said polyethylene fiber with a mixture comprising acrylic acid, water, ethylene dichloride and a salt selected from the group consisting of ferrous ammonium sulfate, copper sulfate and cuprous chloride, at a temperature of 40° to 80° C. to graft polymerize said polyethylene fiber with at least 15% of the acrylic acid based on the weight of said polyethylene fiber, the combination of the contact of the polyethylene fiber with the acrylic acid mixture at said temperature and its irradiation with the ionizing radiation being effective to confer heat resistance and/or fire retardation to the fiber.

4,466,991

CUTTING TOOL HARDENING METHOD

Anatoly A. Andreev, Kharkov; Alexei G. Gavrilov, Moskovskaya; Galina K. Galitskaya, Moscow; Viktor P. Zhed, Moscow; Andrei K. Sinelschikov, Moscow; Valentin G. Padalka, and Vladimir T. Tolok, both of Kharkov, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Instrumentalny Institut, Moscow, U.S.S.R.

Filed Feb. 1, 1983, Ser. No. 462,996
Int. Cl.³ C23C *11/08*
U.S. Cl. 427—38 **9 Claims**



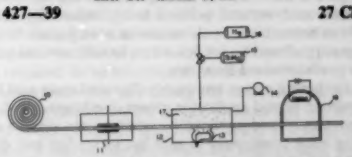
1. A cutting tool hardening method comprising the steps of preheating tools in air to a temperature of 130° to 560° C. during a period of time long enough to produce an oxide film 200 to 10,000 Å thick on their surface, and coating said tools with a wear-resistant material by vacuum deposition.

4,466,992

HEALING PINHOLE DEFECTS IN AMORPHOUS SILICON FILMS

Mark J. Dreiling, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1982, Ser. No. 383,372
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—39 **27 Claims**



1. A method for healing defects in the film layer of a laminate comprising a film on a light-transmitting substrate, the method comprising

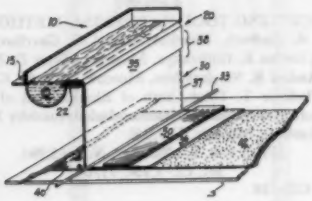
exposing the film layer to an atmosphere comprising a gas which is subject to light-induced deposition as a solid on a substrate, the exposure carried out under conditions suitable for light-induced deposition of the gas or a decomposition product of it as the solid on the substrate, and

directing, through the light-transmitting substrate and then through the defects in the film into the atmosphere, light having a wavelength effective for inducing deposition of the gas or the decomposition product of it as the solid in the defects.

4,466,993
PREPARATION OF FILM OF WEB-REINFORCED PHOTOPOLYMERIZED HYDROPHILIC INTERPOLYMER

Chin C. Hsu, Avon Lake, and Stanley R. Goscewski, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 7, 1983, Ser. No. 464,306
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 15 Claims



1. A method for transfer-coating a laminar web with a low-viscosity liquid, comprising,

(a) continuously flowing said liquid having a viscosity in the range from about 2 centipoise (cp) but below 100 cp, into a reservoir at a rate correlatable to a predetermined thickness of a liquid layer to be formed,

(b) overflowing said liquid from said reservoir so as to provide a feathered overflow forming a gravitating curtain of liquid having vertical and horizontal flow components provided by an angulated applicator curtain means,

(c) continuously transporting a thin delicate web beneath and away from said reservoir, said web being in liquid-transferable contact with said applicator curtain and a conveyor upon which said web is disposed, and

(d) transferring onto said web a substantially uniform layer of said liquid, said layer having a thickness in the range from about 2 mils to about 25 mils.

12. An apparatus for producing a laminar web-reinforced film of a polymer by transfer-coating a thin, delicate web with a polymerizable low-viscosity liquid layer having a thickness greater than that of said web, said apparatus comprising,

(a) reservoir means with a lip including a walled trough having a weir means over which said liquid is overflowed,

(b) an applicator means in fluid communication with the liquid in the reservoir having vertical and horizontal portions, said vertical portion being removably suspended from beneath said weir means so as to permit flow under gravity of said liquid flowed on to said vertical portion at a predetermined flow rate,

(c) feathering means removably disposed upon said lip and a portion of said applicator means overlapping said vertical portion of said applicator curtain means along a smoothing zone contiguous to said lip, to feather and distribute the liquid uniformly across said vertical portion,

(d) edge means to form an angle between said vertical and horizontal portions,

(e) conveyor means not wettable by said liquid, for continuously transporting said delicate web beneath and away from said reservoir, said web being in liquid-transferable contact with said applicator curtain and conveyor upon which it is disposed and,

(f) means for polymerizing said liquid to form a laminar web-reinforced film of polymer.

4,466,994
HEAT TRANSFERABLE LABELS

Karl E. Hubbard, South Grafton, and Augustus Ventre, Saugus, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 305,665, Sep. 24, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,884
Int. Cl.³ B05D 3/06; B41M 5/00
U.S. Cl. 427—56.1 12 Claims

1. A method of transferring an ink design layer, which comprises the steps of:

(a) depositing a release layer onto a carrier web,

(b) screen imprinting over said release layer an ink design layer comprising a screen printing ink, said screen printing ink comprising a base ink vehicle comprised of a resin binder plus pigment, said resin binder comprising a polyamide resin comprised of the reaction product of a diamine and dimerized fatty acid, said ink not comprising a cross-linking agent and said ink being heat transferable from the web to a surface of a receiving article, said article comprised of a nonfibrous material selected from the group consisting of plastic, metal and glass, said ink design layer being sufficiently adhesive to bond to the article upon application of heat and pressure to effect transfer of the ink design layer from the web to said article,

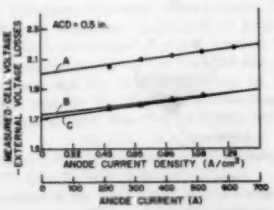
(c) drying the imprinted web so as to dry the ink design layer but not melt the release layer, and

(d) transferring the ink design layer from the carrier web to said article by applying the ink design layer substantially in pressure contact with a surface of the article and simultaneously applying sufficient external heat to the carrier web for a period of less than about two seconds so that the ink layer becomes tacky and the carrier web separable from the transferred ink design layer and subsequently postheat treating the transferred ink design on the article by exposing the transferred ink design on the article to an external heat source having a temperature between about 400° F. to about 3,000° F. for a period of less than about two seconds.

4,466,995
CONTROL OF LEDGE FORMATION IN ALUMINUM CELL OPERATION

Larry G. Boxall, Baltimore, and Douglas W. Townsend, Glen Burnie, both of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jul. 22, 1982, Ser. No. 400,763
Int. Cl.³ B32B 9/04; B44D 1/44; C25C 3/08
U.S. Cl. 422—113 10 Claims



1. A method for the control of ledge formation in a Hall-Heroult electrolytic cell for the production of aluminum, which method consisting essentially of applying to a limited

defined area of the cathode surface directly below the anode of said cell a coating composition comprising Refractory Hard Material, thermosetting binder, a mix liquid, carbonaceous filler, and carbonaceous additive, and curing and carbonizing said composition to produce an adherent coating composition comprising Refractory Hard Material in a carbonaceous matrix bonded by amorphous carbon on said limited defined area of the cathode surface below the anode.

4,466,996

ALUMINUM CELL CATHODE COATING METHOD

Larry G. Boxall; William M. Buchta; Arthur V. Cooke, all of Baltimore; Dennis C. Nagle, Catonsville, and Douglas W. Townsend, Glen Burnie, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jul. 22, 1982, Ser. No. 400,773

Int. Cl.³ B05D *5/12*; C25C *3/06*; C25B *11/12*

U.S. Cl. 427—122 **23 Claims**

1. A method for producing an aluminum wettable cathode surface for an aluminum reduction cell, which method comprises applying to a cathode substrate a coating composition comprised of Refractory Hard Material, a thermosetting binder comprising a single resin selected from the group consisting of phenolic, furane, polyphenylene, heterocyclic, epoxy, silicone, alkyd, and polyimide resins, a mix liquid, carbonaceous filler, and carbonaceous additive, curing said coating composition to produce a relatively hard, adherent surface layer, and carbonizing said layer to produce an adherent aluminum wettable surface layer consisting of Refractory Hard Material in a carbonaceous matrix bonded by amorphous carbon, said surface layer characterized by a percentage of expansion between 800° C. and 1000° C. which differs from the percentage of expansion of said cathode substrate by less than 0.2.

4,466,997

METHOD OF MAINTAINING AND REPAIRING PROTECTIVE COATINGS FOR THE HIGH TEMPERATURE ZONES OF ENGINES

Roger Prescott, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 192,066, Sep. 29, 1980, abandoned. This application Jan. 6, 1982, Ser. No. 337,376

Int. Cl.³ B32B *35/00*

U.S. Cl. 427—140 **5 Claims**

2. A method of repairing a damaged protective coating on the exposed surfaces of at least one component in the high temperature zone of a jet engine or rocket motor during operation thereof which comprises introducing into said engine's fuel an effective amount of a soluble additive which does not react with said protective coating and is capable of being oxidized upon combustion of said fuel to form a compound of a type required to repair said protective coating.

3. A method according to claims **1** or **2** wherein at least one component in the high temperature zone comprises a carbon-carbon composite component coated with silicon carbide and the addtive to the engine's fuel is a silicon-containing compound capable of being oxidized to SiO_2 when the fuel is combusted.

4,466,998

WOOD IMPREGNATION

Craig R. McIntyre, Wadsworth, and Daniel A. Eakin, Wooster, both of Ohio, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 16, 1982, Ser. No. 388,748

Int. Cl.³ B05D *1/18, 3/12*

U.S. Cl. 427—297 **10 Claims**

1. A wood pressure impregnation method comprising:

(a) placing wood in a treating vessel and subjecting the wood to a vacuum of 25 in. Hg to a pressure above atmospheric of up to 100 psig for a period up to 2 hours

(b) filling the vessel with a water-borne preservative salts treating solution that reacts at elevated temperatures with wood constituents to form difficulty soluble precipitates, said treating solution having a temperature of between about 40° F. and about 70° F. while maintaining the pressure of (a),

(c) adjusting the full treating vessel to a positive pressure of between atmospheric and 200 psig, and holding this pressure until a predetermined amount of treating solution has been injected into the wood,

(d) releasing the pressure and returning the treating solution to a storage vessel, whereby the precipitation of preservative salts is obviated or reduced,

(e) removing the excess solution from the wood at a pressure of from atmospheric to 26 in Hg, and

(f) recovering the wood.

4,466,999

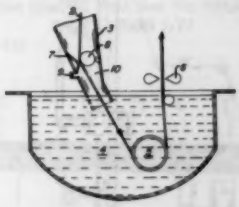
ATMOSPHERIC GAS PRACTICE FOR HOT-DIP COATING OF METALS

Ralph W. Leonard, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 28, 1983, Ser. No. 546,236

Int. Cl.³ B05D *1/18*

U.S. Cl. 427—329 **8 Claims**



1. In the hot-dip coating of ferrous metal strand wherein the strand is passed through a bath of molten metal in which the partial pressure of the metal vapor above the bath is substantial at the temperature at which coating is effected,

the strand is passed through a hood enclosure, the downstream end of which is below the surface of the bath, a protective gas is introduced into said enclosure at an upstream point thereof, said enclosure having internal baffles at a point between said upstream point of protective gas introduction and said downstream end so as to substantially limit the internal cross-sectional area of said enclosure and thereby restrict the amount of protective gas required to be introduced therein,

the improvement for decreasing the amount of such metal vapors depositing on the strand surfaces and the internal parts of the enclosure which comprises, at a point downstream of said baffles but above the bath surface, venting the atmosphere within said enclosure and controlling the rate of introduction of said protective gas and the cross-sectional opening of the vent system so as to vent said atmosphere within said enclosure at a rate of from 300 to 3000 $ft.^3/hr.$

4,467,000
PROCESS FOR COATING A SUBSTRATE WITH POLYIMIDE

James Economy; Willi Volksen, and Do Y. Yoon, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1983, Ser. No. 480,164
Int. Cl.³ B05D *3/02*; C08G *69/26*
U.S. Cl. 427—385.5 **8 Claims**

1. A process for coating a substrate, said process comprising the steps of:

(1) applying to said substrate a solution of an amino-terminated oligomer and an ester, the oligomer being formed from an aromatic diamine and from an aromatic dianhydride and the ester being formed from an aromatic tetracarboxylic acid and an alcohol,

(2) reacting said oligomer and said ester in situ at a temperature between 40° C. and 140° C. so that the ester reacts with an amine group of the oligomer to form a high molecular weight polyamide,

(3) continuing the reaction until a cyclic imide is formed, and

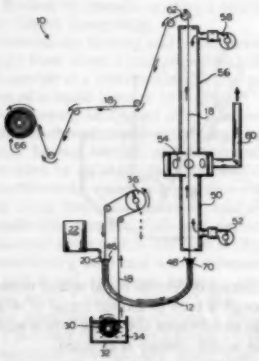
(4) curing the coating by the application of heat.

It is respectfully requested that the above-identified application be reexamined in view of the foregoing amendment and the following remarks.

4,467,001
PROCESS AND DEVICE FOR APPLYING, DRYING AND CURING A COATING ON FILAMENTS

Myron J. Coplan, Natick, and Robert D. Burchesky, Dedham, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,164
Int. Cl.³ B05D *1/18*; B05C *3/12*
U.S. Cl. 427—434.6 **5 Claims**



1. Apparatus for the coating, drying and curing of continuous lengths of multiple filaments, which comprises;

a tubular vessel having a first end for receiving the multiple filaments, a second end for discharging the multiple filaments, a tubular body joining the first and second ends, and a coating chamber defined interiorly of the ends and the body, said body having a "U" shape, said ends individually having a funnel shape and together forming the top of the "U";

means in the second end of the tubular vessel for separating the multiple filaments discharged from said second end;

a drying oven disposed vertically over the second end of the tubular vessel, said oven comprising an enclosure defining an interior drying chamber for drying, an opening in a lower portion of the enclosure into said drying chamber for receiving separated multiple filaments from the second end of the tubular vessel into the drying chamber and an opening in an upper portion of the enclosure out of the drying chamber for passage of the separated multiple filaments out of the drying oven;

means for moving heated drying fluid through the drying chamber and out of the upper opening;

a curing oven disposed vertically above the upper opening of the drying oven and spaced apart from said drying oven, said curing oven comprising a housing defining an interior curing chamber, said housing having an upper end, a lower end, an aperture in the lower end for receiving the separated and dried filaments from the drying oven into the curing chamber and an aperture in the upper end for passing the separated and dried filaments out of the curing chamber;

means for moving heated fluid through the curing chamber and out of the lower aperture;

means for collecting heated fluids and any entrained materials from the upper opening of the drying oven enclosure and the lower aperture of the curing oven housing;

means for the take-up of separated, dried and cured coated multiple filaments passed out of the aperture in the upper end of the housing for the curing oven; and

means for conveying the multiple filaments through the coating chamber, drying chamber, curing chamber to the means for take-up, in a continuous pass.

5. A method of applying a coating to continuous lengths of filaments, which comprises;

providing a tubular vessel having a first end for receiving the multiple filaments, a second end for discharging the multiple filaments, a tubular body joining the first and second ends, and a coating chamber defined interiorly of the ends and the body, said body having a "U" shape, said ends individually having a funnel shape and together forming the top of the "U";

carrying the filaments continuously through said vessel from the first to the second end, whereby they are coated;

separating individual filaments from each other as they pass from the second end of said vessel;

continuously carrying the coated and separated filaments through a means for drying the coating;

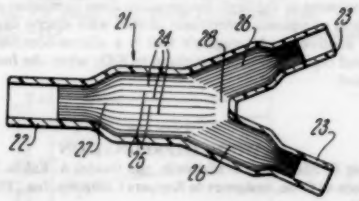
continuously carrying the dried filaments through a means for curing the coating; and

taking up the coated, dried and cured filaments.

4,467,002
DIMENSIONALLY-RECOVERABLE ARTICLE

David Crofts, Cirencester, England, assignor to Raychem Limited, England

Filed Dec. 10, 1982, Ser. No. 448,550
Claims priority, application United Kingdom, Dec. 15, 1981, 8137715
Int. Cl.³ H02G *15/02*
U.S. Cl. 428—36 **18 Claims**



1. A dimensionally recoverable polymeric article for enclosing at least part of an object, the article having one surface at least part of which has an electrically conductive layer adhering thereto, said one surface being profiled in the form of a plurality of grooves that are substantially chevron-shaped in cross-section and that extend substantially perpendicularly to the direction of recovery to allow the article to recover with

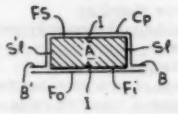
substantially no change in dimension of the surface in the direction of recovery, said grooves accommodating recovery of the article by changing pitch.

4,467,003

VALVES FOR STERILIZABLE FLAT FLEXIBLE CONTAINERS AND PROCESS FOR THEIR MANUFACTURE

Francesco Pallaroni, Manfredi; Luciano Baldini, Milan, and Albert Siccardi, Viale Italia, all of Italy, assignors to Safta S.p.A., Milan and Bieffe S.P.A., Grosotto, both of, Italy

Division of Ser. No. 100,978, Dec. 6, 1979, Pat. No. 4,326,574. This application Dec. 18, 1981, Ser. No. 332,343
Claims priority, application Italy, Dec. 18, 1978, 20940 A/78
Int. Cl.³ B32B *25/12, 27/06, 27/34*
U.S. Cl. 428—64 9 Claims



1. A method of preparation of valves for a flat, flexible, sterilizable container capable of sterilely containing a liquid to be removed under absolutely sterile conditions comprising the steps of:

(a) providing a preformed two-layer laminate having a first layer of a copolymer of ethylene with a minor proportion of butylene and a second layer of an amide polymer;

(b) forming an open pocket in said two-layer laminate wherein said first layer forms the inner surface of said pocket;

(c) providing an elastomeric core element having first and second spaced major faces;

(d) inserting said core element into said pocket in said two-layer laminate;

(e) providing a preformed three-layer laminate having a first outer layer of a major portion of a propylene polymer, a second outer layer of a copolymer of ethylene with a minor proportion of butylene, and an intermediate layer of an amide polymer;

(f) orienting said three-layer laminate so that said second (ethylene-butylene copolymer) outer layer thereof is apposed to said first (ethylene-butylene copolymer) layer of said two-layer laminate;

(g) expelling air surrounding said core element in said pocket;

(h) first welding the apposed ethylene-butylene-copolymers portions of said two- and three-layer laminates to each other and then bonding said second outer layer of said three-layer laminate to the first of said major faces of said core element and said first layer of said two-layer laminate to the second major face of said core element;

(i) cutting through said two- and said three-layer laminates in the region of said weld at a distance removed from said core element, whereby a circular area of said weld remains around said core element.

4,467,004

SLIP SHEET

Henry L. Liebel, Cincinnati, Ohio, assignor to Angleboard Inc., Cincinnati, Ohio

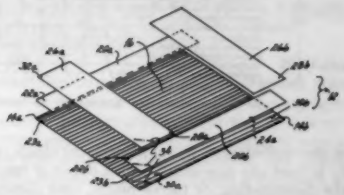
Filed Jul. 6, 1982, Ser. No. 395,717
Int. Cl.³ B32B *3/02, 29/00*
U.S. Cl. 428—81 7 Claims

1. A slip sheet for handling, storing, shipping, and receiving a unitized load of product having a lip adapted to be received in a grasping mechanism for moving the load, comprising:

a first sheet of paperboard having a lip extension along one of its edges, said lip extension having a width and a length,

a pair of second sheets of paperboard laminated to opposed marginal side portions of said first sheet and extending therealong and overlying opposed end portions of said lip extension, each of said second sheets having a width less than the length of said lip extension,

a third sheet of paperboard laminated to said first sheet and to an end portion of each of said second sheets, said third sheet having a longitudinal edge portion overlying the length of said lip extension of said first sheet, the width of



said third sheet being less than the linear dimension of said first sheet in the widthwise direction of said lip extension, but greater than the width of said lip extension,

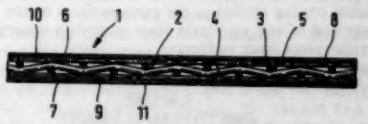
each said sheet having a machine direction whereby said lip extension comprises a two-layer laminated center portion and three-layer laminated end portions, one layer of said end portions having its machine direction perpendicular to the machine direction of the other two layers.

4,467,005

IR-REFLECTING, WATER VAPOR-PERMEABLE FLEXIBLE WEB

Gunter Pusch, Bannholzweg 12, 6903 Neckargemund 2; Reinhold Weimar, Eichendorffstr. 11, 4772 Bad Sassendorf, and Dieter E. Aisslinger, Heidestr. 54, 6222 Geisenheim, all of Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,481
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—111 15 Claims



1. An infrared-reflecting, water vapor-permeable, flexible web comprising a support net, a carrier web affixed to each side of said support net, an external infrared-reflecting metal coating on each of said carrier webs, and an external protective coating on each of said metal coatings, wherein said metal coatings and said protective coatings are substantially permeable to water vapor, and said protective coatings are substantially transparent to infrared radiation.

4,467,006

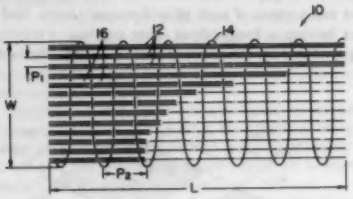
WOVEN REINFORCEMENT FOR PLASTIC

Shigezi Hasegawa; Tadashige Yamaguchi; Yatsuhiro Hasegawa, and Shigekazu Hasegawa, all of Yachiyo, Japan, assignors to Hasegawa Chemical Industry Co., Ltd., Yachiyo, Japan

Continuation of Ser. No. 345,638, Feb. 4, 1982, abandoned. This application Oct. 4, 1983, Ser. No. 538,835
Claims priority, application Japan, Feb. 26, 1981, 56/27455
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—137 2 Claims

1. A woven reinforcement for objects to be formed from plastic materials, the reinforcement comprising warp and weft wherein at least one of the warp and weft of the reinforcement is made from metallic threads, the other of the warp and weft

is made from material selected from the group consisting of glass fibers and carbon fibers and the woven reinforcement is impregnated with a thermoplastic or thermosetting resin, the warp and weft being woven together so as to provide openings



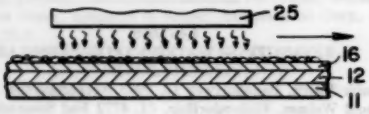
in the reinforcement through which the plastic of the object to be formed can pass easily, which openings remain open after the thermosetting or thermoplastic resin associated with the glass or carbon fibers has been hardened or semi-hardened.

4,467,007

WALL COVERING

Don R. Elgie, 14100 Doolittle Dr., San Leandro, Calif. 94577

Filed Oct. 26, 1983, Ser. No. 545,465
Int. Cl.³ B32B *5/16, 5/22*
U.S. Cl. 428—142 **6 Claims**



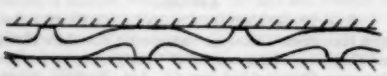
6. An exterior wall covering material, including a web formed of fiberglass material, a bonding layer of thin foam plastic material adhered to one side of said web, an adhesive layer applied to the foam bonding layer, a composite aggregate layer adhered in and bonded to said adhesive layer, and a sealant coating applied to the outer surfaces of said adhesive layer and of said aggregate layer to form a waterproof and weatherproof outer surface.

4,467,008

FRICTIONAL ELEMENT

Mats P. A. Danielsson, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

PCT No. PCT/SE80/00225, § 371 Date Dec. 16, 1980, § 102(e) Date Dec. 16, 1980, PCT Pub. No. WO81/00894, PCT Pub. Date Apr. 2, 1981
Continuation of Ser. No. 220,062, Dec. 16, 1980, abandoned. This PCT application Sep. 19, 1980, Ser. No. 482,514
Claims priority, application Sweden, Sep. 21, 1979, 7907824
Int. Cl.³ B32B *3/00, 3/30*
U.S. Cl. 428—156 **8 Claims**



1. A frictional element sized to be positioned between relatively immovable construction members such that opposite sides of the frictional element frictionally engage respective ones of the construction members to resist relative movement between the construction members, said element comprising a sheet and a plurality of outwardly projecting teeth disposed on both sides of said sheet, said teeth having substantially flat outer faces, the teeth on one side of said sheet being off-set from the nearest teeth on the other side, the spacing between such offset teeth being sufficient to render the portion of the sheet between such offset teeth deformable.

4,467,009

INDIUM OXIDE RESISTOR INKS

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,754
Int. Cl.³ B32B *3/00, 17/00;* **H01C** *1/012*
U.S. Cl. 428—210 **19 Claims**

1. A circuit board having on a portion of the surface thereof a coating of an improved resistor ink comprising:

(a) from about 25 to about 80 percent by weight of indium oxide;

(b) from about 5 to about 60 percent by weight of a barium calcium borosilicate glass frit;

(c) from about 10 to about 35 percent by weight of a suitable organic vehicle; and

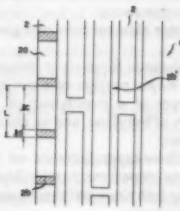
(d) from about 0.1 to about 10 percent by weight of a temperature coefficient of resistance modifier selected from the group consisting of vanadium oxide and ferric oxide.

4,467,010

OIL-IMPREGNATED POLYOLEFIN FILM FOR ELECTRIC INSULATION AND MANUFACTURING METHOD FOR THE SAME

Hikaru Shii, and Humio Sugimoto, both of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,680
Claims priority, application Japan, Feb. 25, 1981, 56-25373
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—212 **25 Claims**



1. An electrically insulating oil-impregnated polyolefin film for electrical insulation having intramicrofibril and intermicrofibril amorphous parts of a uniaxially drawn film of crystalline polyolefin which are impregnated with a low loss insulation oil, said film simultaneously satisfying the following conditions:

(i) a tensile Young's modulus of the film impregnated with the insulation oil is not lower than 2×10^4 kg/cm^2;

(ii) a dimensional change (change in length) of the uniaxially drawn film in the insulation oil at 100° C. is within a tolerance of ±2%;

(iii) a ratio of a long period at room temperature of an ether extraction residue of the uniaxially drawn film to a long period thereof before ether extraction is within a range of 0.900 to 0.998; and

(iv) a dimensional increase of the ether extraction residue in the insulation oil at 100° C. is not lower than 1.0%.

12. A process for manufacturing an oil-impregnated polyolefin film for electric insulation comprising applying a tensile stress of not higher than 40 kg/cm^2 to a uniaxially drawn film of crystalline polyolefin which has a tensile Young's modulus of not lower than 3×10^4 kg/cm^2, and, at the same time, immersing the drawn film in a low loss insulation oil heated to a temperature lower by 50° to 10° C. than the melting point of

the polyolefin in said oil to produce an oil-impregnated polyolefin film for electric insulation in which intramicrofibril and intermicrofibril amorphous parts of a uniaxially drawn film of crystalline polyolefin are impregnated with a low loss insulation oil, and which simultaneously satisfies the following conditions:

(i) a tensile Young's modulus of the film impregnated with the insulation oil is not lower than 2×10^4 kg/cm^2;

(ii) a dimensional change (change in length) of the uniaxially drawn film in the insulation oil at 100° C. is within a tolerance of ±2%;

(iii) a ratio of a long period at room temperature of an ether extraction residue of the uniaxially drawn film to a long period thereof before ether extraction is within a range of 0.900 to 0.998; and

(iv) a dimensional increase of the ether extraction residue in the insulation oil at 100° C. is not lower than 1.0%.

4,467,011

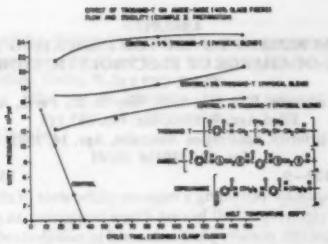
INJECTION MOLDABLE AMIDE-IMIDE POLYMERS AND COPOLYMERS CONTAINING AMORPHOUS POLYAMIDES

Gary T. Brooks, and Bill W. Cole, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

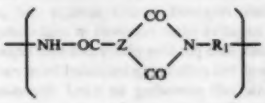
Filed May 28, 1982, Ser. No. 383,268

Int. Cl.³ B32B *7/00*

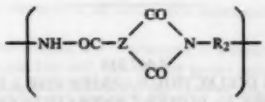
U.S. Cl. 428—245 **6 Claims**



1. A laminate comprising amide-imide copolymer solution impregnated graphite woven fabric layers or glass fabric layers, said copolymer comprising units of:



and units of:



and including up to about 20 percent by weight of amorphous polyamide wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from about 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from about 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit.

4,467,012

COMPOSITION FOR ABSORBENT FILM AND METHOD OF PREPARATION

Lee C. Pedersen, Delano, and Lyle F. Elmquist, St. Paul, both of Minn., assignors to Grain Processing Corporation, Muscatine, Iowa

Division of Ser. No. 290,385, Aug. 5, 1981, Pat. No. 4,412,036. This application Jun. 13, 1983, Ser. No. 503,414

Int. Cl.³ B32B *23/02, 23/08, 27/30*

U.S. Cl. 428—248 **20 Claims**

1. An absorbent film comprising at least one backing layer and an absorbent composition secured to said backing layer including the reaction product of hydrolyzed starch polyacrylonitrile graft copolymer and a polyhydric alcohol in which, based upon the total weight of the composition, said hydrolyzed starch polyacrylonitrile graft copolymer is present in an amount of about 80% to 97% by weight and said polyhydric alcohol is present in an amount of about 20% to 3% by weight.

6. A method of preparing an absorbent film comprising applying an absorbent composition to a backing layer in which said absorbent composition includes a mixture of hydrolyzed starch polyacrylonitrile graft copolymer and a polyhydric alcohol in which, based upon the total weight of the composition, said hydrolyzed starch polyacrylonitrile graft polymer is present in an amount of about 80% to 97% by weight and said polyhydric alcohol is present in an amount of about 20% to 3% by weight and exposing said backing layer and said absorbent composition to a temperature and pressure sufficient to bond the same together.

7. The method of claim 6 wherein the hydrolyzed starch polyacrylonitrile graft copolymer is present in the amount of about 90% to 97% by weight and said polyhydric alcohol is present in an amount of about 10% to 3% by weight.

9. The method of claim 7 including feeding said backing layer and absorbent composition between a pair of rollers.

4,467,013

BIOACTIVE WATER AND ALCOHOL-REPELLANT MEDICAL FABRIC

A. Frank Baldwin, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 352,057, Feb. 24, 1982, Pat. No. 4,411,928, which is a continuation-in-part of Ser. No. 310,416, Oct. 9, 1981, Pat. No. 4,408,996, and Ser. No. 310,414, Oct. 9, 1981, Pat. No. 4,414,268. This application Jul. 20, 1982, Ser. No. 400,093

Int. Cl.³ B04H *1/58;* **B05D** *3/02*

U.S. Cl. 428—289 **2 Claims**

1. A bioactive, water-repellent, alcohol-repellent nonwoven cellulosic medical fabric having incorporated thereon a non-leachable, bioactive amount of 3-(trimethoxysilyl)-propyloctadecyl dimethyl ammonium chloride present in an amount of from about 0.15% to about 1.05% on the basis of the weight of the fabric together with an alcohol and saline-repelling amount of a fluoropolymer repellent.

4,467,014

POLYISOCYANURATE-COATED FOAM INSULATION BOARD AND METHOD OF PREPARATION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Continuation-in-part of Ser. No. 398,369, Jul. 14, 1982, Pat. No. 4,426,461. This application Apr. 6, 1983, Ser. No. 482,631

The portion of the term of this patent subsequent to Jan. 17, 2000, has been disclaimed.

Int. Cl.³ C08G *18/14;* **B32B** *3/26, 5/18, 23/00*

U.S. Cl. 428—314.4 **28 Claims**

1. A polyisocyanurate coating composition, which composi-

tion is prepared by reacting 100 parts by weight of a methylene diisocyanate, having an average functionality of less than about 2.4, with from about 25 to 50 parts by weight of a di or triethylene glycol, and with from about 25 to 150 parts by weight of a C_1–C_3 alkoxy poly C_2–C_3 alkylene glycol, the reaction carried out in the presence of a trimerization catalyst and in the substantial absence of a blowing agent.

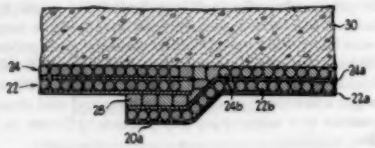
20. A coated, rigid, insulating, foam-board article which comprises a rigid, insulating, substantially closed-cell foam-board composition suitable for use for insulating purposes, a thin aluminum-foil material bonded to one surface of the foam composition, and a solid coating layer of the polyisocyanurate coating composition of claim 1 on the opposite surface of the foam composition.

4,467,015

WATERPROOFING STRUCTURE

Arthur G. Clem, 363 Cambridge Rd., Des Plaines, Ill. 60016

Filed Nov. 2, 1981, Ser. No. 317,059
Int. Cl.³ B32B *19/00, 29/04*
U.S. Cl. 428—454 **7 Claims**



1. A water impermeable structure for protecting a surface or area against damage due to water seepage, comprising: at least two layers positioned in stacked, superposed relation to one another and capable of being formed into a roll, each layer including a sheet of a water permeable material and a continuous coating of dry particles, of a preselected size, of bentonite on one surface of said sheet, said particles of bentonite being adhered to said one surface of the sheet by a film of an adhesive, each layer of the structure being adhered in fixed relation to a contiguous layer by means of an adhesive applied between the uncoated surface of a sheet of a water impermeable material comprising one layer of the structure and the continuous coating of dry particles of bentonite of said contiguous layer of the structure, at least one continuous coating of dry particles of bentonite comprising a layer of the stack structure being exposed, the layers of the structure being arranged in fixed relation to one another such that the said at least one exposed continuous coating of dry particles of bentonite will be in contact with or face in the direction of a surface or area to be protected against damage due to water seepage, said dry particles of bentonite being characterized in that they form a water impermeable barrier upon contact with water.

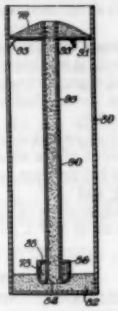
4,467,016

ALUMINIZED CHROMIZED STEEL

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 359,212, Mar. 18, 1982, , and a continuation-in-part of Ser. No. 238,500, Feb. 6, 1981, Pat. No. 4,350,719, and a continuation-in-part of Ser. No. 851,504, Nov. 14, 1977,. This application Jul. 16, 1982, Ser. No. 398,830
Int. Cl.³ B21C *37/00*
U.S. Cl. 428—595 **6 Claims**

1. The process of protecting against hot sulfidation a low alloy steel tube that is to be welded in place, which process is characterized by the steps of subjecting the tube to a heavy diffusion chromizing, followed by a diffusion aluminizing in which the aluminizing is arranged to leave the welding sites



with a surface aluminum content less than about 10% without masking.

6. The product produced by the process of claim 1.

4,467,017

MEASUREMENT DEVICE FOR INDICATING THE STATE-OF-CHARGE OF ELECTROLYTIC STORAGE TYPE CELLS

Terry R. Jackson, P.O. Box 6079, Hay St. E., Perth, Australia

Filed Apr. 9, 1982, Ser. No. 367,117
Claims priority, application Australia, Apr. 14, 1981, PE8487
Int. Cl.³ H01M *10/48*
U.S. Cl. 429—9 **13 Claims**

1. A device for providing a measure of the state of charge of a storage electrolytic cell having a case containing an electrolyte, at least one positive plate immersed in said electrolyte and providing a positive post, and at least one negative plate immersed in said electrolyte and providing a negative post, comprising a test electrolytic cell located within said electrolyte of said storage electrolytic cell said positive plate and said negative plate of said storage electrolytic cell each have a respective recess formed therein, said test electrolytic cell comprising a positive plate received in said storage cell positive plate recess and a negative plate received in said storage cell negative plate recess, said positive plates and said negative plates of said storage and test cells being insulated from each other, said test electrolytic cell providing an e.m.f. dependent upon the state of charge of said storage electrolytic cell.

4,467,018

MANIFOLD DIELECTRIC BARRIER FOR A FUEL CELL ELECTRICAL POWER GENERATION SYSTEM

Craig R. Schroll, Hartford County, Conn., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jul. 31, 1981, Ser. No. 288,913
Int. Cl.³ H01M *8/24*
U.S. Cl. 429—18 **15 Claims**

1. A fuel cell electrical power generation apparatus, comprising:

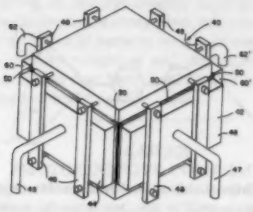
(a) a fuel cell;

(b) external manifolds for respectively conveying an oxygen-rich gas and fuel into said fuel cell and for carrying away spent products from said fuel cell; and

(c) manifold barrier means for dielectrically isolating said

fuel cell from said manifolds wherein said barrier means includes:

(i) an impermeable ceramic member, and



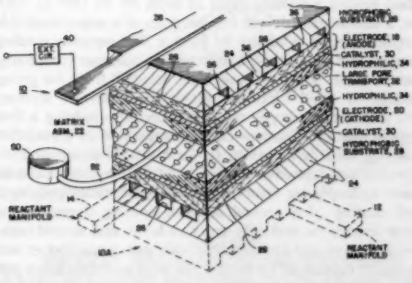
(ii) a gasket intermediate of and contiguous with said ceramic member and said fuel cell.

4,467,019

FUEL CELL WITH ELECTROLYTE FEED SYSTEM

Haim Feigenbaum, Highland Park, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed Sep. 30, 1982, Ser. No. 430,156
Int. Cl.³ H01M 8/04
U.S. Cl. 429—34 **5 Claims**



1. In a fuel cell system including a fuel cell having electrodes wherein electrochemical reactions take place between fluidic reactants and an electrolyte, an electrolyte distribution system comprising:

first and second porous layers arranged in a laminated format within said fuel cell, one of said layers being electrically insulating but permitting the flow of ionic current when filled with electrolyte;

said first layer having relatively large pores for holding electrolyte in an ionic conduction path between said electrodes and for in-plane transporting of electrolyte;

said second layer having relatively small pores for drawing electrolyte from said first layer, said second layer being positioned contiguous to an interaction surface of one of said electrodes for supplying electrolyte to the electrochemical reaction at said one electrode;

a reservoir supporting electrolyte outside said fuel cell; and

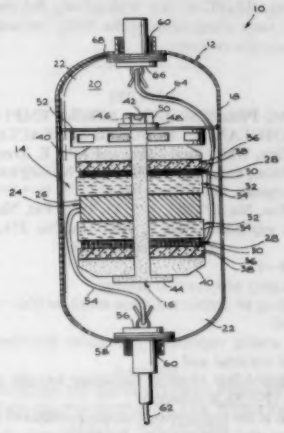
means for conducting said electrolyte between said first layer and said reservoir, said means communicating directly between said first layer and said reservoir.

4,467,020

RECHARGEABLE LEAD-HYDROGEN ELECTROCHEMICAL CELL

Vincent J. Puglisi, Waterford, Conn., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Jan. 21, 1983, Ser. No. 459,841
Int. Cl.³ H01M 12/08
U.S. Cl. 429—101 **10 Claims**



1. An improved rechargeable lead-hydrogen electrochemical cell, said cell comprising, in combination:

a. a cell stack including

i. a positive electrode comprising lead oxide,

ii. a pair of gas-porous negative electrodes containing catalyst for said cell,

iii. an electrolyte comprising aqueous sulfuric acid,

iv. a pair of separators, and,

v. a pair of gas screens, each of said negative electrodes having one of said separators disposed on one side thereof and one of said gas screens disposed on the opposite side thereof, said electrodes and separators containing said sulfuric acid;

b. retaining means secured to and supporting said cell stack;

c. a pressure vessel disposed around and spaced from said cell stack and said retaining means, said pressure vessel containing inlet means and electrical leads connected to, respectively, said positive and negative electrodes; and,

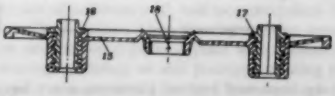
d. hydrogen gas disposed within said pressure vessel.

4,467,021

CELL-CONTAINER AND CELL-LID FOR ELECTRIC-ACCUMULATORS PARTICULARLY FOR THOSE MEANT FOR TRACTION

Olimpio Stocchiero, 4 - Via Kennedy, 36050 Montorso Vicentino, Italy

Filed Dec. 20, 1982, Ser. No. 451,084
Claims priority, application Italy, Dec. 21, 1981, 85653 A/81; Apr. 8, 1982, 85548 A/82
Int. Cl.³ H01M 2/04
U.S. Cl. 429—175 **3 Claims**



1. Cell-lid for the electric-accumulators molded in polypro-

pylene-copolymer, characterized in that it has a concave surface turned towards the outside of the cell-container and a profile of the section of the cell-lid which extends downwardly from the rim to a central area where said profile is connected with bushes of accumulator's poles and with a central-inlet of the electrolyte-solution in order to enable the poles, rigidly welded to the bushes incorporated in the cell-lid in the molding-process, to elongate during the service-life of the accumulator itself, as said cell-lid can, without any deformation-damage, follow such elongations while being hermetically hot-sealed to the cell-container.

4,467,022

IMAGING PROCESS AND ARTICLE EMPLOYING PHOTOLABILE, BLOCKED SURFACTANT

Gilbert L. Eian, White Bear Lake, and John E. Trend, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 177,287, Aug. 11, 1980, Pat. No. 4,369,244. This application May 3, 1982, Ser. No. 374,434

Int. Cl.³ G03C 5/24

U.S. Cl. 430—17 **18 Claims**

1. An imaging process comprising:

(1) providing an actinic radiation-sensitive film comprising a blend of:

(a) an actinic radiation-transmissive film-forming polymeric material and

(b) a photolabile blocked surfactant has the general formula $(P—X)_aR$ wherein

$(—X)_aR$ is the hydrogen-eliminated residue of a surfactant having the formula $(H—X)_aR$ wherein X is a polar hydrophilic divalent radical;

P is a convalently bonded photolabile masking group which prior to exposure to actinic radiation masks the polar properties of X and upon exposure to actinic radiation will unmask the polar properties of X;

R is a hydrophobic group which provides in said surfactant $(H—X)_aR$ a log (critical micelle concentration) equal to or less than −2; and

a is a number from 1 to 4 to satisfy the valency of R; and

(2) exposing said actinic light sensitive film to actinic radiation in an image-wise pattern at an intensity and for a time sufficient to release an image-wise pattern of released surfactant in the exposed areas of said film, said released surfactant being present in a detectable amount and having a log critical micelle concentration equal to or less than −2.

4,467,023

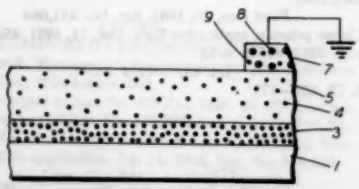
LAYERED PHOTORESPONSIVE DEVICE CONTAINING HOLE INJECTING GROUND ELECTRODE

Joseph Y. C. Chu, and Donald C. Von Hoene, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 15, 1983, Ser. No. 523,311

Int. Cl.³ G03G 5/14

U.S. Cl. 430—66 **16 Claims**

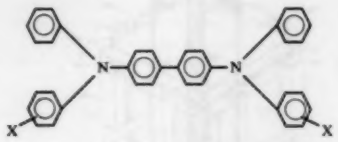


1. An improved layered photoresponsive imaging device consisting of

(1) a supporting substrate,

(2) a photogenerating layer comprised of a charge carrier photogenerating pigment dispersed in a resinous binder,

(3) a hole carrier transport layer, comprised of molecules of the formula:



dispersed in a highly insulating and transparent organic resinous material, wherein an X is selected from the group consisting of (ortho) CH_3, (meta) CH_3, (para) CH_3, (ortho) Cl, (meta) Cl, (para) Cl, and a hole injecting electrode strip comprised of carbon black particles and graphite particles dispersed in a resinous binder, which strip is attached to and extends the length of the non-image areas of the hole carrier transport layer.

4,467,024

PROCESS FOR THE PRODUCTION OF THERMO-DEVELOPABLE TYPE DIAZO COPYING MATERIAL

Norio Kurisu, Numazu; Tsutomu Matsuda, Shizuoka; Hideo Watanabe, and Nobuyoshi Watanabe, both of Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 445,873

Claims priority, application Japan, Dec. 8, 1981, 56-197126

Int. Cl.³ G03C 1/60, 1/54, 1/58, 1/74

U.S. Cl. 430—166 **7 Claims**

1. A process for preparing a thermally developable diazo copying material, which comprises: mixing a heat-fusible color assistant having a melting point of from 50° to 150° C. with water, a diazonium salt and fine particles of a water-insoluble hydrophobic resin whereby to form a first aqueous coating dispersion, said hydrophobic resin being a polymer comprising at least 60 mole % of monomer units selected from the group consisting of vinyl chloride, vinylidene chloride, styrene, acrylic esters, methacrylic esters and olefins; applying a first coating of said first aqueous coating dispersion on a substrate and drying said first coating to form a light-sensitive layer comprising said diazonium salt, said heat-fusible color assistant and said hydrophobic resin on said substrate; then applying a second coating of a second aqueous coating dispersion or solution directly on said light-sensitive layer, said second coating being free of said hydrophobic resin and containing an azo dye coupler capable of forming a dye with said diazonium salt when said copying material is heated, and then drying said second coating to form a coupler layer directly on top of said light-sensitive layer.

7. A thermally developable diazo-type copying material comprising:

a support;

a first layer on said support, said first layer consisting essentially of a blend of a diazonium compound suitable for use in a two component diazo-type copying material, from 1 to 50 parts by weight, per 1 part by weight of said diazonium compound, of a heat-fusible color assistant having a melting point of from 50° to 150° C. and from 1 to 50 parts by weight, per 1 part by weight of said diazonium compound, of fine particles of a hydrophobic resin, said heat-fusible color assistant being insoluble or sparingly soluble in water and having a particle size in the range of from about 0.1 to about 1μ, said fine particles of water-insoluble hydrophobic resin having a particle size of 10μ or less, said hydrophobic resin being a polymer composed of from 60 to 100 mole % of monomer units selected from the group consisting of vinyl chloride, vinylidene chloride, styrene, acrylic esters, methacrylic esters and olefins, and

up to 40 mole % of a different monomer copolymerizable therewith; and

a second layer applied directly on top of said first layer and in surface-to surface contact therewith, said second layer containing an azo dye coupler capable of forming a dye with said diazonium compound, said second layer containing from 0.5 to 20 parts by weight of said azo dye coupler, per 1 part by weight of said diazonium compound contained in said first layer, said second layer being free of said hydrophobic resin.

4,467,025

PHOTOSENSITIVE COMPOSITIONS

Kiyoshi Goto, Hino; Hiroh Kawada, Itsukaichi, and Noriyasu Kita, Musashimurayama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

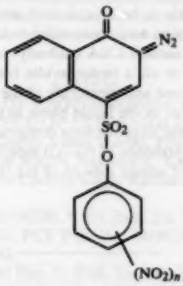
Continuation of Ser. No. 248,301, Mar. 27, 1981, abandoned, which is a continuation of Ser. No. 90,869, Nov. 2, 1979, abandoned. This application Feb. 15, 1983, Ser. No. 466,719

Claims priority, application Japan, Nov. 2, 1978, 53-136208

Int. Cl.³ G03C *1/52*

U.S. Cl. 430—191 **9 Claims**

1. A photosensitive composition comprising a first o-naphthoquinone diazido compound represented by the following general formula



wherein n is an integer of 2–5, in an effective amount up to 40% by weight based on said composition, a triphenylmethane dye in an amount of 0.5 to 5% by weight, and an alkali soluble, non-photosensitive resin.

4,467,026

PROCESS FOR DRAWING PATTERNS WITH EXTREMELY FINE FEATURES IN THE PRODUCTION OF VLSI, LSI AND IC SYSTEMS

Kazufumi Ogawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 20, 1983, Ser. No. 459,627

Claims priority, application Japan, Jan. 20, 1982, 57-8129

Int. Cl.³ G03C *5/16*

U.S. Cl. 430—296 **3 Claims**

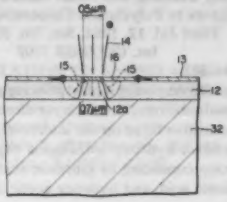
1. A process for forming a pattern having extremely fine features, comprising the steps of:

coating one major surface of a wafer with a layer comprising a resist exposable by X-rays;

overcoating the exposed surface of said resist layer with a thin metal film comprising a material which emits characteristic X-rays when bombarded with an electron beam of sufficient energy;

exposing said resist layer by scanning the exposed surface of said thin metal film with a finely focused beam of electrons having sufficient energy to cause said thin film to emit said characteristic X-rays,

whereby at least some of said characteristic X-rays impinge upon said resist layer to expose regions of said resist layer adjacent points where said finely focused beam of electrons impinges upon said thin metal film;



removing said thin metal film; and

developing said resist layer.

4,467,027

PROCESS OF DEVELOPING POSI-TYPE LITHOGRAPHIC PRINTING PLATE WITH INORGANIC ALKALI SOLUTION

Takeshi Yamamoto; Kiyoshi Goto; Yoshio Kurita; Noriyasu Kita, and Naoshi Kunieda, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,119

Claims priority, application Japan, May 25, 1981, 56-79056

Int. Cl.³ G03F *7/08*

U.S. Cl. 430—302 **19 Claims**

1. A method of developing a posi-type lithographic printing plate having a sanded, anodically oxidized aluminum plate as a support with an imagewise exposed posi-type photosensitive layer thereon, said layer containing a photosensitive o-quinonediazide compound and an organic polymer, said method comprising developing said printing plate with an aqueous inorganic alkali solution containing a sufficient quantity amount of an inorganic alkali agent and a reducing inorganic salt selected from the group consisting of at least one inorganic salt of sulfurous acid and phosphorous acid to remove exposed portions with substantially no ground stain occurring on the printing plate.

11. A method of developing (i) a posi-type lithographic printing plate having a sanded, anodically oxidized aluminum plate as a support with an imagewise exposed posi-type photosensitive layer thereon, said imagewise exposed posi-type photosensitive layer containing a photosensitive o-quinonediazide compound and an organic polymer; and (ii) a nega-type lithographic printing plate having a sanded, anodically oxidized aluminum plate as a support with an imagewise exposed nega-type photosensitive layer thereon, said imagewise exposed posi-type photosensitive layer containing a photosensitive diazo compound and an organic polymer, said method comprising developing said posi-type and nega-type printing plates with an aqueous inorganic alkali solution containing a sufficient quantity amount of an inorganic alkali agent and a reducing inorganic salt selected from the group consisting of at least one inorganic salt of sulfurous acid, said inorganic alkali solution having a pH of at least 11 to thereby remove exposed portions from said posi-type printing plate with substantially no ground staining occurring on said posi-type printing plate and to thereby remove unexposed portions from said nega-type printing plate with substantially no ground staining occurring on said nega-type printing plate.

4,467,028

ACID INTERLAYERED PLANOGRAPHIC PRINTING PLATE

Jen-chi Huang, Ossining, and James Shelnut, Mahopac, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,659
Int. Cl.³ G03F 7/02
U.S. Cl. 430—302 13 Claims

1. A presensitized planographic printing plate comprising an anodized metal substrate, an interlayer directly on the substrate and a photosensitive layer on the interlayer, wherein the interlayer comprises a hydroxy substituted organic acid selected from the group consisting of gluconic acid, tartaric acid, hydroxy propionic acid, and hydroxy acetic acid.

4,467,029

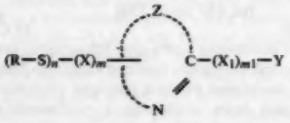
METHOD FOR PRODUCING A PHOTOGRAPHIC IMAGE FROM A LIPPMANN TYPE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshikazu Nishide; Akio Kobayashi, both of Hino, and Tamio Kitahata, Musashimurayama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,222
Claims priority, application Japan, Mar. 18, 1982, 57-43840
Int. Cl.³ G03C 5/24, 1/06, 1/02
U.S. Cl. 430—441 18 Claims

1. A method for producing a photographic image from an imagewise exposed silver halide light-sensitive photographic material, said material comprises a support and a Lippmann emulsion layer on said support containing a silver halide and at least one compound of the following formula I in a quantity of at least 3.5×10^{-3} mole per mole of said silver halide of said Lippmann emulsion layer:

Formula I



wherein Z represents an atomic group necessary to form a substituted or unsubstituted heterocyclic ring; Y is a hydrogen atom or —S—R_1 group; R and R_1 are each a hydrogen atom, an alkali-metal atom, ammonium or an alkyl group; X and X_1 are each a divalent organic group; m and m_1 are each 0 or 1; and n is an integer of up to 3, provided if n is 0, Y is —S—R_1 group;

comprising developing said material in a developer containing at least 0.6 mole per liter of sulfurous ions.

4,467,030

DETERMINATION OF THE THYROXINE-BINDING INDEX IN SERUM

Gerd Kleinhammer, Tutzing; Gerlinde Deutsch, Pöcking; Hans-Ralf Linke, Raisting; Fritz Stähler, Tutzing, and Wolfgang Gruber, Tutzing-Unterzeismering, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 045,373, Jun. 4, 1979, abandoned. This application May 15, 1981, Ser. No. 263,948
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825650
Int. Cl.³ G01N 33/54, 33/58, 33/78
U.S. Cl. 435—7 8 Claims

1. Method for determining the thyroxine-binding index in serum comprising:

(a) mixing a sample of the serum with (1) a predetermined amount of thyroxine and (2) a predetermined amount of enzyme-labeled thyroxine;

(b) contacting the solution resulting from step (a) with insolubilized anti-thyroxine;

(c) separating the resulting liquid phase from the resulting solid phase;

(d) measuring the enzyme activity in either the liquid or the solid phase of step (c); and

(e) relating the measured enzyme activity to the thyroxine-binding index in the serum.

4,467,031

ENZYME-IMMUNOASSAY FOR CARCINOEMBRYONIC ANTIGEN

Harald Gallati, Dornach, and Hans Brodbeck, Münchenstein, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 16, 1982, Ser. No. 408,388
Claims priority, application Switzerland, Aug. 21, 1981, 5403/81; Nov. 11, 1981, 7258/81
Int. Cl.³ G01N 33/54
U.S. Cl. 435—7 16 Claims

1. In a solid phase-sandwich method for the rapid determination of carcino-embryonic antigen (CEA) which comprises incubating a sample to be investigated with a first CEA antibody, which is bound to or becomes bound to a water-insoluble carrier, and a second CEA antibody, to which peroxidase is bound directly or via a biotin/avidin bridge, separating the solid and liquid phase and measuring of the peroxidase activity either in the solid or in the liquid phase as the amount of CEA present, wherein the improvement comprises carrying out the incubation in the presence of 0.4–1.0 mol/l of phosphate ions, of 0.2–0.4 mol/l of sulfate ions or of 0.2–0.4 mol/l of tartrate ions.

4,467,032

IDENTIFICATION AND ENUMERATION OF MICROBIAL CELLS

George E. Lowke, Hurst, Tex., and Robert J. Meltzer, Long Valley, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 26, 1982, Ser. No. 371,906
Int. Cl.³ C12Q 1/04, 1/29, 1/06; C12M 1/34
U.S. Cl. 435—34 13 Claims

1. A method for identifying and enumerating microbial cells in a sample of unknown material comprising:

A. isolating a quantity of said sample of unknown material;

B. combining said sample with at least one inhibiting reagent having a known specificity for said microbial cells;

C. placing said combined sample in an alternating current electrical field, said electrical field having a frequency sufficiently high to cause any of said microbial cells present in said sample, to move into alignment therewith;

D. passing a polarized beam of laser light through said combined sample and measuring the extent of birefringence thereof; and

E. comparing the birefringence of said combined sample with the birefringence of a control sample, known to contain the microbial cell under investigation, in combination with said inhibiting reagent;

F. wherein said control sample is prepared and measured in accordance with Steps A–D herein, and the presence of said microbial cell in the unknown sample is determined from said comparison.

4,467,033

PROCESS FOR OXIDIZING L-SORBITOL TO L-FRUCTOSE

Robert O. Horwath, Westport, and William J. Colonna, Wilton, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,847
Int. Cl.³ C12P 19/02; C12N 15/00, 9/04
U.S. Cl. 435—105 4 Claims

1. A process for oxidizing L-sorbitol to L-fructose which comprises contacting L-sorbitol with D-iditol dehydrogenase produced by a mutant microorganism of the genus Pseudomonas cultivated in the absence of an inducing polyol.

4,467,034

PROCESS FOR THE PRODUCTION OF D-LACTIC ACID WITH THE USE OF *LACTOBACILLUS BULGARICUS* DSM 2129

Hartmut Voelskow, Hattersheim am Main, and Dieter Sukatsch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,473
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131717
Int. Cl.³ C12P 7/56; C12N 1/20; C12R 1/225
U.S. Cl. 435—139 10 Claims

1. A process for producing D-lactic acid which comprises anaerobically fermenting a nutritive medium comprising glucose, lactose, or both, with *Lactobacillus bulgaricus* DSM 2129.

4,467,035

CULTIVATION OF PHOTOTROPHIC BACTERIA IN THE ABSENCE OF ULTRAVIOLET LIGHT

Isamu Harasawa, Kiyose; Yukio Hariki, Funabashi; Katsuhiko Maeda, Uozu, and Koichi Nakamura, Uozu, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00294, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982, PCT Pub. No. WO82/01890, PCT Pub. Date Jun. 10, 1982
PCT Filed Dec. 4, 1980, Ser. No. 403,731
Int. Cl.³ C12N 1/20, 1/00; C12R 1/01
U.S. Cl. 435—253 12 Claims

1. A process for producing phototrophic bacteria which comprises cultivating a phototrophic bacterium selected from the group consisting of the genera Rhodopseudomonas, Rhodospirillum, Rhodomicrobium and Chloroflexus, in a light field substantially free from ultraviolet light having a wavelength of not more than 340 nm.

4,467,036

BACILLUS THURINGIENSIS CRYSTAL PROTEIN IN *ESCHERICHIA COLI*

H. Ernest Schnepf, and Helen R. Whiteley, both of Seattle, Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Continuation-in-part of Ser. No. 320,560, Nov. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 257,963, Apr. 27, 1981, Pat. No. 4,448,885. This application Mar. 30, 1982, Ser. No. 362,634
The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.
Int. Cl.³ C12N 1/00, 15/00, 1/20; C12P 21/00; A01N 63/00
U.S. Cl. 435—317 3 Claims

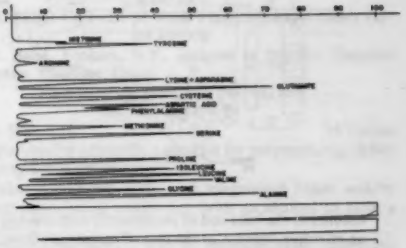
1. A hybrid recombinant plasmid capable of replication in an *Escherichia coli* bacterial host species, said plasmid containing expressible heterologous DNA coding for a polypeptide which has the immunological properties of the crystal protein of *Bacillus thuringiensis*, said plasmid further containing expressible heterologous DNA having a DNA portion derived from plasmids of *Bacillus thuringiensis* having a molecular mass greater than 10×10^6 M_r, said *Bacillus thuringiensis* derived DNA portion being identifiable with a Pvu II-C DNA fragment probe, said hybrid recombinant plasmid further comprising an expression mechanism for said expressible heterologous DNA which is recognized by the host species' system.

4,467,037

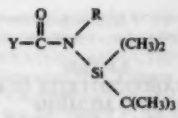
SILYLATION OF AMINO ACIDS

Thomas P. Mawhinney, Columbia, Mo., and Michael A. Madson, Clear Lake, Iowa, assignors to The Curators of the University of Missouri, Columbia, Mo.

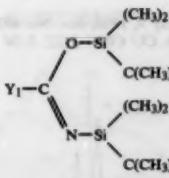
Filed Mar. 1, 1982, Ser. No. 353,358
Int. Cl.³ G01N 31/08
U.S. Cl. 436—89 6 Claims



1. In a method for analyzing amino acids by silylating said amino acids under silylating conditions with a silylating agent, the improvement which comprises selecting the silylating agent from compounds having the structure:



or



wherein:

R is lower alkyl having 1 to 5 carbon atoms,

Y is hydrogen, lower alkyl having 1 to 5 carbon atoms, or perfluoroloweralkyl having 1 to 5 carbon atoms, and

Y_1 is hydrogen or lower alkyl having 1 to 5 carbon atoms.

4,467,038

PREDETECTOR RESERVOIR FOR CHROMATOGRAPHIC ANALYSIS INSTRUMENT

Richard L. Scott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

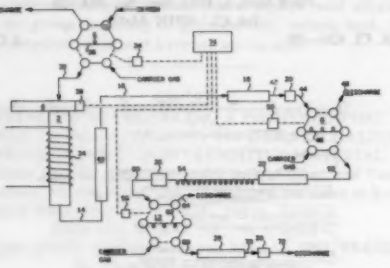
Filed Nov. 30, 1981, Ser. No. 326,109
Int. Cl.³ G01N 31/08
U.S. Cl. 436—115 26 Claims

20. A method for chemical analysis of a sample in an instrument comprising a gas chromatography column having an inlet

end and an outlet end and a detector having an inlet end and an outlet end, comprising the steps of:

(a) introducing at least a portion of the sample in the form of a mixture of gases into the inlet end of the gas chromatography column and passing the mixture of gases through the column in a carrier gas having a flow rate R so as to separate at least one component of interest from the mixture of gases;

(b) passing the component of interest into a conduit directly extending from the outlet end of the gas chromatography



column to the inlet end of the detector said conduit having an effective volume, at the rate of carrier gas flow, at least sufficient to contain the constituent to be detected plus the volume of associated carrier gas;

(c) passing the component of interest through the conduit in the carrier gas having the flow rate R;

(d) passing the component of interest to the inlet end of the detector after the essentially complete elution of the component of interest from the gas chromatography column; and

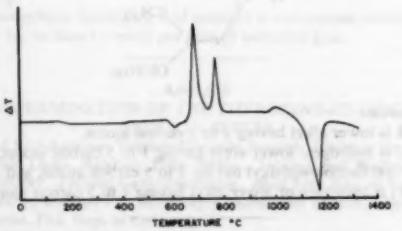
(e) detecting a property of the component of interest.

4,467,039

POTASSIUM FLUORRICHTERITE GLASS CERAMICS AND METHOD

George H. Beall, Big Flats, and John E. Megles, Jr., Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 9, 1983, Ser. No. 492,953
Int. Cl.³ C03C *3/22, 3/04*
U.S. Cl. 501—3 **7 Claims**



1. A highly crystalline glass-ceramic article exhibiting high toughness and a modulus of rupture in excess of 20,000 psi, wherein the predominant crystal phase is potassium fluorrichterite and having an overall composition consisting essentially, expressed in terms of weight percent on the oxide basis, of about

SiO_2: 50–70
CaO: 4–15
MgO: 8–25
F: 3–8
Na_2O: 2–9
K_2O: 2–12
Li_2O: 0–3
Al_2O_3: 0–7.

4,467,040

PREPARATION AND USE OF HIGH POROSITY SILICOCALCAREOUS MASS

Maurice Bruni, Tremblay-Les-Gonesse; Georges Delode, Champigny-sur-Marne, and Rolland Perraudin, Bagnolet, all of France, assignors to L'Air Liquide - Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 330,450, Dec. 14, 1981,. This application May 11, 1982, Ser. No. 377,185
Claims priority, application France, May 13, 1981, 81 09538
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.³ C04B *21/00, 43/02, 43/12*
U.S. Cl. 501—80 **12 Claims**

1. In a process for preparing a high-porosity silicocalcareous mass comprising firing an aqueous paste based on a mixture of silica and lime, the improvement wherein the paste consists essentially of lime, water, and silica consisting at least in part of ultrafine synthetic silica, the aqueous paste consisting of at least, based on the total silica, 50% by weight of particles of amorphous ultrafine synthetic silica having a specific surface between 150 and 300 m^2 per gram and a high absorption capacity such that 100 g thereof can absorb at least 150 ml of dioctylphthalate to begin forming a paste thereof, the total amount of silica being slightly greater than the amount of lime in a proportion of 10 to 30% excess, and water being present in the paste in an amount of 3 to 4.6 times greater than that of the solids.

4,467,041

SILICOCALCAREOUS MASS WITH HIGH POROSITY AND ITS PREPARATION

Maurice Bruni, Tremblay-les-Gonesse; Georges Delode, Champigny-sur-Marne, and Rolland Perraudin, Bagnolet, all of France, assignors to L'Air Liquide - Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude, Paris, France

Filed Dec. 14, 1981, Ser. No. 330,450
Claims priority, application France, May 13, 1981, 81 09538
Int. Cl.³ C04B *21/00, 43/02, 43/12*
U.S. Cl. 501—80 **7 Claims**

1. In a process for preparing a silicocalcareous mass having high porosity, comprising firing an aqueous paste having a silica and lime mixture base, the improvement wherein the paste consists essentially of lime, water, about 3–15% based on solids of synthetic fibers, and silica made up at least in part by ultrafine synthetic silica, wherein the aqueous paste contains at least 50%, based on total silica, of ultrafine synthetic silica with a large specific surface of 200 to 500 m^2 per gram, the total amount of silica being slightly greater than the amount of lime in a proportion of 10 to 20% excess and the water being present in an amount at least three times greater than that of the solids.

4,467,042

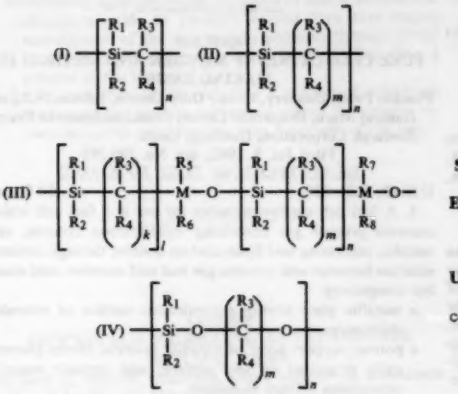
REFRACTORIES WITH FLAKY β-SILICON CARBIDE

Tokuaki Hatta; Haruyuki Ueno; Yuji Katsura; Kazushige Fukuda; Hiroshi Kubota, and Takashi Hamamatu, all of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Division of Ser. No. 230,179, Jan. 30, 1981, Pat. No. 4,387,080. This application Jan. 27, 1982, Ser. No. 343,082
Claims priority, application Japan, Jan. 31, 1980, 55-11281
Int. Cl.³ C04B *35/56*
U.S. Cl. 501—88 **1 Claim**

1. Refractories excluding MgO refractories and CaO refrac-

tories in which the content of flaky β-SiC is in the range of 1% to 60% by weight, said flaky β-SiC having a flaky shape with a thickness of 10μ to 100μ and a width and length of 100μ to 10 mm and being obtained from an organic silicon polymer consisting of the carbon and silicon atoms as the major skeletal components, said polymer being selected from at least one of the following unit structures (I)–(IV):



wherein

R_1 is $-CH_3$, and R_2, R_3 and R_4 are one or more members selected from the group consisting of hydrogen, alkyl, aryl, $(CH_3)_2CH-$, $(C_6H_5)_2SiH-$ and $(CH_3)_3Si-$;

k, l, m and n are the respective numbers of repetition of the unit structures defined by the immediately preceding parenthesis or brackets and K = 1–80, l = 15–350, m = 1–80, and n = 15–350, the average molecular weight of the polymer being in range of 800–20000; M is a metallic or non-metallic element which is Si, B, Ti, Fe, Al, Zr or Cr; and

R_5, R_6, R_7 and R_8 are one or more members selected from the group consisting of hydrogen, alkyl, aryl, $(CH_3)_2CH-$, $(C_6H_5)_2SiH-$ and $(CH_3)_3Si-$, and any one or more of R_5, R_6, R_7 and R_8 may be absent depending on the valence of M and the unit structure.

4,467,043

DENSE SHAPED ARTICLES OF POLYCRYSTALLINE α-SILICON CARBIDE AND PROCESS FOR THE MANUFACTURE THEREOF BY HOT-PRESSING

Jochen Kriegesmann, Durach-Bechen; Alfred Lipp, Bad Worishofen, and Klaus Reinmuth, Durach, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 158,730, Jun. 12, 1980, abandoned. This application Jun. 23, 1983, Ser. No. 507,932

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923728

Int. Cl.³ C04B *35/36*

U.S. Cl. 501—88 **15 Claims**

1. A process for the manufacture of shaped articles of polycrystalline silicon carbide having a density of at least 99% of the theoretical density of SiC, consisting essentially of:

at least about 98.8% by weight of α-silicon carbide;

from 0.1 to 0.4% by weight of aluminum;

up to about 0.4% by weight of nitrogen and/or phosphorus;

up to about 0.2% by weight of oxygen; and

up to about 0.2% by weight of carbon, the α-silicon carbide being in the form of a homogeneous microstructure having grain sizes of not more than 12 μm and the other constituents being substantially in the form of a solid solution in the α-SiC lattice, and having a flexural strength of at least 600 N/mm^2, up to at least 1450° C., measured according to the four-point method at a stress rate of at least 3 $N.mm^{-2}.sec^{-1}$, and a predominately transgranular fracture mechanism, said process comprising:

(a) forming a homogeneous mixture of pulverulent silicon carbide substantially in the form of the α-modification and having a particle size distribution of 3 μm and finer with from 0.1 to 0.4% by weight of the mixture calculated as free aluminum based on the total weight of solid constituents of an aluminum-containing additive as a sintering aid, and

(b) hot-pressing the mixture in a die at a temperature of from 1850° C. to 2300° C. and a die pressure of at least 100 bar in an atmosphere inert to silicon carbide or in a vacuum for a sufficient length of time to form the desired product.

4,467,044

SUPPORTED CATALYST FOR POLYMERIZATION OF OLEFINS

Elliot I. Band, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 20, 1982, Ser. No. 451,631

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—111 **14 Claims**

8. A process for preparing a catalyst for polymerizing olefins comprising the steps of:

(a) infusing siliceous oxide with magnesium halide and/or manganese halide complexed with an alcohol to form a support;

(b) reacting the support with an organometallic compound of a metal from Groups I to III of the periodic table to form an intermediate;

(c) reacting the intermediate with an electron donor to form an intermediary complex; and

(d) reacting the intermediary complex with a fluid comprising a transition metal halide.

4,467,045

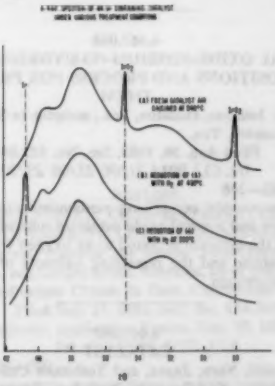
REDISPERSION OF IR CATALYSTS BY LOW TEMPERATURE REDUCTION STEP

Shun C. Fung, Bridgewater, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 30, 1982, Ser. No. 428,927

Int. Cl.³ B01J *23/96, 23/46;* C10G *35/09, 35/085*

U.S. Cl. 502—35 **10 Claims**



1. A process for reactivating an agglomerated iridium oxide-containing catalyst comprising the steps of:

(a) contacting said agglomerated catalyst with an atmosphere comprising elemental hydrogen, at a temperature in the range of about 190° C. up to about 250° C. and a pressure of about 0.1 to 2.0 MPa for a sufficient time to

substantially convert said iridium oxide to metallic iridium which after reduction is not evidenced by X-ray diffractometry; and

(b) contacting said metallic iridium from step (a) with an atmosphere comprising elemental halogen at a temperature in the range of about 450° to 600° C. for a sufficient time to effect about a 70 to 100% redispersion of said metallic iridium.

6. The process of claim 1 wherein said elemental halogen in step (b) is chlorine.

7. The process of claim 6 wherein said atmosphere in step (b) also contains elemental oxygen.

4,467,046

DEHYDROGENATION CATALYST

James L. Smith, 8805 High Point Cir., Louisville, Ky. 40299; Bill S. Masters, 8000 Troutwood Ct., Louisville, Ky. 40291, and Dennis J. Smith, 10708 Blackwood Rd., Jeffersontown, Ky. 40299

Filed Jan. 7, 1982, Ser. No. 337,943

Int. Cl.³ B01J *23/10, 23/78, 23/88, 27/20*

U.S. Cl. 502—174 **5 Claims**

1. A dehydrogenation catalyst including 15 to 30% by weight of a compound selected from the group consisting of the oxide and carbonate of an alkali metal 2% to 8% by weight of cerium oxide, 1.5 to 6.0% by weight of molybdenum oxide, 1 to 8% by weight of a compound selected from the group consisting of the oxide and carbonate of calcium and the balance iron oxide for the dehydrogenation of organic alkyl materials to correspondingly less saturated materials.

4,467,047

METAL OXIDE-TANTALUM (V) HYDRIDE/OXIDE COMPOSITIONS AND PROCESS FOR PREPARING THEM

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1983, Ser. No. 527,896

Int. Cl.³ B01J *21/04, 21/08, 23/20*

U.S. Cl. 502—246 **12 Claims**

1. A composition comprising pentavalent tantalum, hydrogen, oxygen and a metal oxide substrate wherein at least one valence of the tantalum is bound to oxygen which is bound to the substrate and the remaining valences of tantalum are bound to hydrogen.

4,467,048

METAL OXIDE-NIOBIUM (V) HYDRIDE/OXIDE COMPOSITIONS AND PROCESS FOR PREPARING THEM

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1983, Ser. No. 527,897

Int. Cl.³ B01J *21/04, 21/08, 23/20*

U.S. Cl. 502—246 **12 Claims**

1. A composition comprising pentavalent niobium, hydrogen, oxygen and a metal oxide substrate wherein at least one valence of the niobium is bound to an oxygen which is bound to the substrate and the remaining valences of niobium are bound to hydrogen.

4,467,049

CATALYST

Tsuneo Yoshii, Nara, Japan, and Toshitaka Ueda, 5-23, Yagicho, 3-chome, Kashihara-shi, Nara-ken, Japan, assignors to Toshitaka Ueda, Nara, Japan

Filed Jun. 3, 1983, Ser. No. 500,914

Claims priority, application Japan, Feb. 2, 1983, 58-16522

Int. Cl.³ B01J *23/16;* **C10G** *45/04, 45/60, 29/06*

U.S. Cl. 502—317 **7 Claims**

1. A catalyst prepared by a process which comprises:

reacting at least one member selected from the group consisting of carbonyl compounds of molybdenum, salts of molybdenum, oxides of molybdenum, metallic molybdenum and alloys containing molybdenum, with an alkali and water at a temperature from 220° to 450° C. under a carbon monoxide atmosphere, and

reducing the resultant reaction product in the presence of a phenol at a temperature from 400° to 450° C. under a hydrogen atmosphere.

4,467,050

FUEL CELL CATALYST MEMBER AND METHOD OF MAKING SAME

Pinakin Patel, Danbury, Conn.; Dilip Dharia, Edison, N.J., and Hansraj Maru, Brookfield Center, Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Jul. 8, 1982, Ser. No. 396,399

Int. Cl.³ B01J *21/04, 23/02, 23/78, 35/02*

U.S. Cl. 502—330 **50 Claims**

1. A fuel cell catalyst member for use in a fuel cell which receives process gas containing hydrocarbon content, said member reforming said hydrocarbon content through communication between said process gas and said member, said member comprising:

a metallic plate having a continuous surface of extended dimension;

a porous support layer of ceramic material electrophoretically deposited on said surface, said ceramic material comprising lithium aluminate;

and an active catalyst material dispersed in said support layer.

4,467,051

METHOD OF PRODUCING A CELLULAR RESIN SUITABLE FOR USE AS AN INSULATING MATERIAL

Gilles Finaz; Robert Michon, and Michel Rasclard, all of Lyons, France, assignors to Societe d'Application et de Developpement de Techniques Nouvelles, S.A.D.E.V., Villeurbanne, France

Filed Sep. 20, 1983, Ser. No. 533,859

Claims priority, application France, Sep. 20, 1982, 82 16071

Int. Cl.³ C08J *9/02;* **C08G** *18/48*

U.S. Cl. 521—77 **15 Claims**

1. A method of producing a cellular resin which comprises the steps of condensing at least one methyloldihydroxydiphenylmethylene ether isomer of the empirical formula $C_{15}H_{16}O_4$.

4,467,052

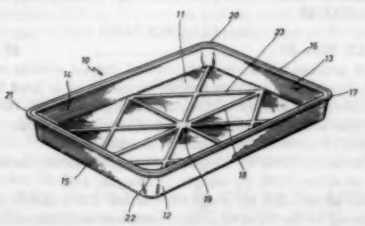
TRAY FOR PACKAGING FOOD PRODUCTS

Robert Barnwell, Pittsburg, and David R. Frye, Longview, both of Tex., assignors to Plasti-Pak, Pittsburg, Tex.

Filed Mar. 18, 1982, Ser. No. 359,252

Int. Cl.³ C08J *9/08*

U.S. Cl. 521—92 **4 Claims**



1. An injection moldable plastic tray composition for packaging meat products and having satisfactory resistance to

breakage in a food processing application, comprising in a blended combination:

a polypropylene having a melt flow rate of 25 to 35 grams per ten minutes to provide a base material for a plastic tray, where the polypropylene comprises about 85 percent of the tray;

a styrene-butadiene copolymer impact modifier to provide toughness in the tray, where the styrene-butadiene copolymer comprises about 15 percent of the tray;

a nucleating agent including a mixture of silicon dioxide and aluminum oxide to promote crystal formation during manufacture of the tray and to promote flatness of the tray, where the nucleating agent comprises less than 1 percent of the tray; and,

density reduction agents including a mixture of anhydrous citric acid and sodium carbonate, where the density reduction agents comprise less than 1 percent of the tray.

4,467,053

PROCESS FOR PRODUCING AN EXPANDABLE SILICONE RESIN

Richard A. Markle, Columbus, Ohio, assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Dec. 28, 1983, Ser. No. 566,276
Int. Cl.³ C08J 9/02
U.S. Cl. 521—128 12 Claims

1. A process for the production of an expandable silicone resin containing powder comprising:

heating a silicone resin having a formula of: $R_nSiO_{4-n/2}$ where R is selected from the group consisting of methyl, ethyl, vinyl and phenyl radicals and n has an average value of from 1 to 1.5 inclusive, to a temperature to condense the latent water into free water until approximately 20% to 70% of the latent water has been condensed and evaporated to effect an increase in molecular weight of the silicone resin;

blending a particulate inert filler and a blowing agent in an environment in which the blowing agent does not generate substantial amounts of gas with the silicone resin to form a mixture, the blending of the blowing agent and inert filler with the resin being either separately or simultaneously;

cooling the mixture to a solidified mass;

reducing the solidified mass into a powder which expands when heated above the gas-generating temperature of the blowing agent.

4,467,054

FOAMS BASED ON LOW FORMALDEHYDE-EMISSION UREA-FORMALDEHYDE RESIN AND PROCESS FOR THEIR PREPARATION

Natale Conti, Rasa, and Massimo Tardani, Busto Arsizio, both of Italy, assignors to Montedison S.p.A., Milan, Italy

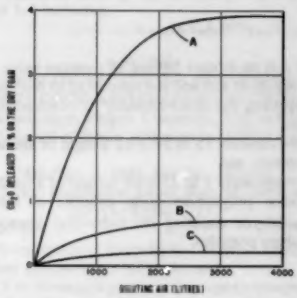
Filed May 14, 1982, Ser. No. 378,182
Claims priority, application Italy, May 15, 1981, 21725 A/81
Int. Cl.³ C08J 9/30
U.S. Cl. 521—188 2 Claims

1. A composition based on a formaldehyde-urea condensate, suitable for preparing solid foams to be used as thermal insulating material, and obtained according to the following procedures:

(a) mixing of formaldehyde with water and urea to obtain a molar ratio formaldehyde-urea of from 2.2 to 1.7 and a pH comprised between 6.3 and 6.8;

(b) addition of hexamethylenetetramine in a quantity comprised between 2% and 15% by weight with respect to the final dry product, at a temperature of between 40° and 80° C. and at a pH between 8.5 and 10;

(c) heating up to 90°–95° C., and successive addition of an acid catalyst and condensation at 90°–100° C. at a pH



comprised between 4 and 6 until obtaining a viscosity of from 50 to 120 cP;

(d) neutralizing with sodium hydroxide up to a pH of between 6.0 and 7.0 and then adding urea until reaching a molar ratio formaldehyde-urea of between 1.2 and 1.4; then condensing at 85°–95° C. until reaching a viscosity between 80 and 120 cP (measured at 20° C.);

(e) neutralizing with sodium hydroxide up to a pH of between 7.5 and 7, and successive cooling down to 25°–30° C.;

(f) optionally finally drying the cooled product to obtain it in a powdery state.

4,467,055

FILLED POLYMERIC COMPOSITIONS COMPRISING NOVEL POLYMER/FILLER INTERFACING ADDITIVE

Jean Machurat, Neuville sur Saone; Jean-Claude Morawski, Chassieu, and Gerard Soula, Meyzieu, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Sep. 24, 1982, Ser. No. 423,264
Claims priority, application France, Sep. 30, 1981, 81 18381
Int. Cl.³ C08K 5/20, 3/36
U.S. Cl. 523—200 32 Claims

1. In a polymeric composition of matter comprising a polymer matrix and a reinforcing amount of a filler therefor, the improvement which comprises, as an interfacing additive between said matrix and said reinforcing filler, the condensation product of at least one polyamine with at least one carboxylic acid comprising a natural fatty acid or a synthetic carboxylic acid.

4,467,056

PARTICULATE AGENT FOR IMPEDING THE COMBUSTIBILITY OF COMBUSTIBLE MATERIALS

Horst Staendeke; Franz-Josef Dany; Joachim Kandler, all of Erftstadt, and Wilhelm Adam, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,869

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1979, 2949537

Int. Cl.³ C08K 9/10

U.S. Cl. 523—208 8 Claims

1. Particulate agent based on free-flowing pulverulent ammonium polyphosphates of the general formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n is an integer having an average value of from approximately 20 to 800 and the ratio of m to n is approximately 1, for impeding the combustibility of combustible materials, comprising

(a) approximately 75 to 99% by weight of ammonium polyphosphate; and

(b) approximately 1 to 25% by weight of a hardened water-insoluble polycondensation product of melamine and formaldehyde encasing the individual ammonium polyphosphate particles.

4,467,057

MODIFIED POLYESTER COMPOSITION

Ronald L. Dieck, and Allen D. Wambach, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 372,294, Apr. 27, 1982, abandoned, which is a continuation of Ser. No. 966,864, Dec. 6, 1978, abandoned. This application May 13, 1983, Ser. No. 473,352

Int. Cl.³ C08K 00/00

U.S. Cl. 523—212 16 Claims

1. A thermoplastic composition comprising:

(a) a polyester composition comprising:

(i) a block copolyester of poly(1,4-butylene terephthalate) and an aromatic/aliphatic or aliphatic polyester;

(ii) a blend of (i) and a poly(ethylene terephthalate) resin; or

(iii) a blend of (i) and a poly(1,4-butylene terephthalate) resin;

(b) an impact modifier therefor comprising a combination of:

(i) a selectively hydrogenated monoalkenyl arene-diene block copolymer resin; and

(ii) an aromatic polycarbonate resin, in an amount of from at least about 1.0 up to 60 parts per 100 parts by weight of (a) and (b) together; and

(c) an effective amount of a mineral filler therefor selected from the group consisting of clay, mica and talc.

4,467,058

Patent Not Issued For This Number

4,467,059

Patent Not Issued For This Number

4,467,060

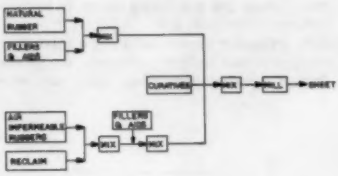
HETEROGENEOUS RUBBER HAVING LOW AIR DIFFUSION

Biing-Lin Lee, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 24, 1983, Ser. No. 460,424

Int. Cl.³ C08J 3/00

U.S. Cl. 523—353 18 Claims



1. A process for making an air permeability resistant rubber composition, comprising the steps of:

(a) forming a heterogeneous rubber composition comprising by weight, approximately 100 total parts of rubber and from about 40 to about 130 parts of a filler, said rubber consisting essentially of from about 25 to about 80 parts by weight of natural rubber and from about 20 to about 75 parts by weight of an air impermeable rubber selected from the class consisting of chlorobutyl rubber, bromobutyl rubber, neoprene and combinations thereof, said rubber composition formed by

(b) separately forming a minor fraction comprising from about 15 to about 80 parts by weight of said natural rubber and from about 0 to about 10 parts by weight of said air impermeable rubber, and from about 30 to about 90 parts by weight of said filler,

(c) separately forming a major fraction comprising from about 10 to about 75 parts by weight of said air impermeable rubber, from about 0 to about 10 parts by weight of said natural rubber, and from about 1 to about 80 parts by weight of said filler,

(d) separately mixing and heating at least one of said fractions, and (e) mixing together under heat said major fraction and said minor fraction to produce said heterogeneous rubber composition.

10. An air permeable resistant heterogeneous rubber composition, comprising:

a mixed blend of a major fraction and a minor fraction forming said heterogeneous rubber composition, said major fraction and said minor fraction having at least one rubber therein, and said major fraction and said minor fraction having similar fillers therein,

said heterogeneous composition comprising by weight approximately 100 parts by weight of total rubber, and from about 40 to about 130 parts by weight of said filler, said total rubber consisting essentially of, from about 25 to about 80 parts by weight of natural rubber and from about 20 parts to about 75 parts by weight of an air impermeable rubber selected from the class consisting of chlorobutyl rubber, bromobutyl rubber neoprene and combinations thereof,

said minor fraction having from about 15 to about 80 parts by weight of natural rubber, and from about 0 to about 10 parts by weight of an air impermeable rubber, and from about 30 to about 90 parts by weight of a filler, said major fraction having from about 10 to about 75 parts by weight of an air impervious rubber, from about 0 to about 10 parts by weight of natural rubber, and from about 1 to about 80 parts by weight of said filler.

4,467,061

WEATHER RESISTANT POLYOLEFIN COMPOSITION

Noboru Yamamoto, Tokyo; Masakichi Shimada, Irumagun; Shigeo Yamazaki, Kawagoe; Tsuyoshi Kanai; Kazuo Sei, both of Yokohama, and Yoshiro Umemoto, Nagoya, all of Japan, assignors to Tonen Sekiyu Kagaku Kabushiki Kaisha, Tokyo and Toyota Jidosha Kabushiki Kaisha, Aichi, both of, Japan

Filed Dec. 27, 1982, Ser. No. 454,184
Claims priority, application Japan, Dec. 28, 1981, 56/209895
Int. Cl.³ C08K *5/10, 5/34, 5/29*
U.S. Cl. 524—87 11 Claims

1. A polyolefin composition comprising a polyolefin containing 20–79 wt% of crystalline polyolefin, 20 to 50 wt% of ethylene-α-olefin copolymer rubber and 1 to 30 wt% of inorganic filler blended with (1) at least one benzotriazole compound, (2) at least one heterocyclic hindered amine compound and (3) at least one of phenyl benzoate compound or nickel complex compound.

4,467,062

FLAME RETARDED POLYETHYLENE TEREPHTHALATE BLENDS

Edwin D. Hornbaker, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Aug. 18, 1983, Ser. No. 524,339
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—89 20 Claims

1. A flame retarded thermoplastic composition which comprises in intimate admixture:

(a) a polyethylene terephthalate,

(b) a copolymer of a vinyl aromatic compound and an alpha,beta-unsaturated cyclic anhydride, said copolymer being a rubber-modified graft copolymer or a rubber-free copolymer,

(c) a bis-imide flame retardant having at least 8 halogen atoms in the molecule bonded to carbon atoms of aromatic ring systems, and

(d) optionally, an inorganic synergist for said flame retardant.

4,467,063

ONE PACKAGE, STABLE, MOISTURE CURABLE, ALKOXY-TERMINATED ORGANOPOLYSILOXANE COMPOSITIONS

Thomas P. Lockhart, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,530
Int. Cl.³ C08L *83/04, 83/06;* C08K *5/34*
U.S. Cl. 524—106 7 Claims

1. A one-package, substantially anhydrous, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a substantially acid-free, tack-free elastomer comprising by weight,

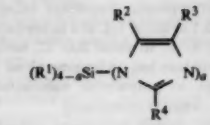
(A) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least one alkoxy radical,

(B) an effective amount of condensation catalyst

(C) from 0 to 0.1 part, per part of the alkoxy terminated organopolysiloxane of (A) of a cross-linking polyalkoxysilane,

(D) 0 to 0.1 part of an amine accelerator, per part of the alkoxy terminated organopolysiloxane and

(E) a stabilizing amount of a N-silyl-substituted imidazole of the formula



where R^1 is selected from $C_{(1-8)}$ aliphatic radicals, substituted $C_{(1-8)}$ aliphatic radicals, $C_{(6-13)}$ aromatic hydrocarbon radicals and substituted $C_{(6-13)}$ *aromatic hydrocarbon radicals, and* R^2, R^3 and R^4 are selected from hydrogen, $C_{(1-8)}$ alkyl, $C_{(1-8)}$ alkenyl, and $C_{(6-13)}$ aryl, and a is an integer equal to 1–4 inclusive.

4,467,064

METHOD OF MANUFACTURING POLYESTER FIBERS WITH GOOD ADHESION TO RUBBER

Kazushige Kudo, Joyo; Shigeo Yamamoto, Uji, and Shigemitsu Murase, Joyo, all of Japan, assignors to Unitika Ltd., Osaka, Japan

Filed Nov. 2, 1981, Ser. No. 317,666
Claims priority, application Japan, Nov. 11, 1980, 55-159021
Int. Cl.³ C08K *5/15*
U.S. Cl. 524—114 11 Claims

1. A finish composition for polyester fiber to improve adhesion to rubber comprising a lubricant and

(a) about 5 to 50 weight percent of an epoxy compound, and

(b) about 3 to 30 weight percent of a novolak resin.

2. The composition of claim 1 wherein the lubricant is present in an amount of 20 to 70 weight percent.

4,467,065

SEMI-CRYSTALLINE POLYMERS STABILIZED FOR IRRADIATION STERILIZATION

Joel Williams, Cary; Terry Dunn, and Vivian Stannett, both of Raleigh, all of N.C., assignors to Becton Dickinson and Company, Paramus, N.J.

Division of Ser. No. 74,250, Sep. 10, 1979, Pat. No. 4,274,932.
This application Jan. 8, 1981, Ser. No. 223,526
Int. Cl.³ C08K *5/00, 5/01, 5/02, 5/12*
U.S. Cl. 524—296 11 Claims

1. A composition having improved irradiation sterilization stability when subject to irradiation, comprising: A semi-crystalline polyolefin having a crystalline content of from 20–90%, and a narrow molecular weight distribution wherein the ratio of the weight average molecular weight to the number average molecular weight is no greater than 9.0 said polyolefin having incorporated therein a mobilizing amount of a non-crystalline liquid mobilizing additive which increases the free volume of the polymer, said composition resisting embrittlement during and subsequent to irradiation sterilization.

4,467,066

PRODUCTION OF IGNITION-RETARDANT POLYMERS

Robert A. Fletcher, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1982, Ser. No. 452,592
Int. Cl.³ C08L *53/02;* C08J *3/22*
U.S. Cl. 524—371 12 Claims

1. A process for preparing an ignition retardant, impact improved poly(vinyl aromatic) composition, which comprises:

(a) thermally polymerizing a solution of a thermoplastic elastomeric radial block copolymer of a monoalkenyl arene polymer and an elastomeric conjugated diene polymer and a non-thermoplastic polydiene elastomer dissolved in a monomer feed in which the sole polymerizable monomer component consists essentially of one or more mono(vinyl aromatic compounds, the weight proportions of elastomers to monomer being about 2 to about 25 parts elastomer (combined) in, respectively, about 98 to about

75 parts monomer, and the proportions of the non-thermoplastic to thermoplastic elastomers being from, respectively, about 5:1 to about 1:1, at a temperature in the range of from about 90° C. to about 200° C., with agitation until the reaction mixture has undergone phase inversion, for a time sufficient to polymerize substantially all of the mono(vinyl aromatic) compound;

(b) removing any residual monomers, to yield an interpolymer containing discrete gelled rubber particles;

(c) blending the resultant interpolymer with:

(i) ignition retardant additives; and

(ii) a thermoplastic, elastomeric block copolymer of a monoalkenyl arene polymer and an elastomeric conjugated diene polymer, the amounts being selected so that the final composition contains from about 1 to about 50% by weight of the composition of ignition retardant additives and from about 1 to about 12% by weight of the composition of thermoplastic elastomeric block copolymer with part of the thermoplastic elastomeric block copolymer in the final composition being added in (a) and part being added in (c).

4,467,067

ELECTROLESS NICKEL PLATING

Silvester P. Valayil, Shrewsbury, and Vita Aroeson, Worcester, both of Mass., assignors to Shipley Company, Newton, Mass.

Continuation-in-part of Ser. No. 453,816, Dec. 27, 1982, abandoned. This application Nov. 22, 1983, Ser. No. 554,397

Int. Cl.³ C08K *3/08*

U.S. Cl. 524—435 **14 Claims**

1. In an electroless nickel solution comprising a source of nickel ions, a reducing agent therefor, a complexing agent and a pH adjustor, the improvement comprising the addition to the electroless plating solution of a polymer consisting of polymerized units of a 2-acrylamido or 2-methacrylamido alkyl sulfonic acid in an amount sufficient to increase the rate of plating.

4,467,068

COMPOSITION FOR CONCEALING GRAZE MARKS ON GLASS

Kazo Maruyama, and Akitsugu Kurita, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed May 18, 1983, Ser. No. 495,860

Int. Cl.³ C08G *77/42*; C08L *83/10*; B32B *17/10*

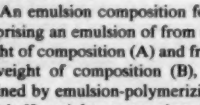
U.S. Cl. 524—731 **17 Claims**

1. An emulsion composition for concealing grazes on glass comprising an emulsion of from about 10 to about 50 parts by weight of composition (A) and from about 50 to about 90 parts by weight of composition (B), said composition (A) being obtained by emulsion-polymerizing:

(1) 0.1–60 weight percent based on composition (A) of the reaction product of:

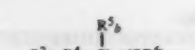
(a) 0.1–50 weight percent based on the total of (a) and (b) of the product obtained by reacting:

(i) 1 mole of a compound of the formula



wherein Q^1 is a monovalent radical selected from the group consisting of hydrogen, $-CH_3$, $-CH_2CH_2NH_2$ and $-CH_2CH_2NHCH_2CH_2NH_2$; R^1 is a divalent hydrocarbon group having 3–4 carbon atoms; R^2 and R^3 are monovalent hydrocarbon radicals having 1–4 carbon atoms and a is an integer equal to 0 or 1; with

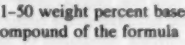
(ii) 0.5–3.0 moles of a compound of the formula



wherein Q^2 represents an epoxy group-containing group selected from the group consisting of glycidoxy and epoxycyclohexyl groups, R^4 is a divalent hydrocarbon radical having 2–4 carbon atoms, R^5 and R^6 are monovalent hydrocarbon radicals having 1–4 carbon atoms and b is an integer equal to 0 or 1; with

(b) 50–99.9 weight percent based on the total of (a) and (b) of a polydiorganosiloxane having at least one terminal silanol group in the molecule and a viscosity at 25° C. of 5–10,000 cSt.

(2) 1–50 weight percent based on composition (A) of a cyclic compound of the formula



wherein R^7 and R^8 are the same or different substituted or unsubstituted hydrocarbon radicals having 1–50 carbon atoms and n is an integer equal to 3–6 inclusive;

(3) 0.1–20 weight percent based on composition (A) of a cationic surfactant or a surfactant mixture of cationic and nonionic surfactants;

(4) 20–90 weight percent based on composition (A) of water; and

(5) an effective amount of an alkaline metal hydroxide having catalytic ability; and

said composition (B) being obtained by emulsifying in water a polydiorganosiloxane having a viscosity at 25° C. of 10–100,000 cSt in the presence of a surfactant selected from the group consisting of nonionic surfactants, cationic surfactants and mixtures thereof.

4,467,069

Patent Not Issued For This Number

4,467,070

THERMOSETTING COATING COMPOSITION COMPRISING POLYMERIC CATALYST - III

Panagiotis I. Kordomenos, Mt. Clemens, and Kenneth R. Kurple, Anchorville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 431,467

Int. Cl.³ C08L *63/10*

U.S. Cl. 525—110 **40 Claims**

1. A novel, organic solvent based, thermosetting coating composition comprising:

A. epoxy ester resin of number average molecular weight (M_n) about 1000 to about 5000, being the reaction product of diepoxide with (i) diphenol in chain extension reaction, (ii) dicarboxylic acid in chain extension reaction, and (iii) monobasic fatty acid in chain terminating esterification reaction, which chain extension reactions and esterification reaction occur substantially simultaneously at a reaction temperature reaching at least about 137° C., wherein the epoxy functionality, phenol functionality, dicarboxylic acid carboxyl functionality and fatty acid carboxyl functionality are employed in relative proportions of about 1:0.2–0.6:0.1–0.4:0.4–0.9 equivalents, respectively;

B. polyfunctional aminoplast crosslinking agent; and

C. polycarboxy functional polymeric catalyst of number average molecular weight (M_n) about 1,000–10,000 being substantially unreactive at room temperature with the epoxy ester resin and the polyfunctional aminoplast crosslinking agent, in an amount of about 2% to about 15% by weight of resin solids in the coating composition.

4,467,071

EPOXY MODIFIED STRUCTURAL ADHESIVES HAVING IMPROVED HEAT RESISTANCE

Terrance H. Dawdy, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Sep. 13, 1982, Ser. No. 416,835
Int. Cl.³ C08L *63/00, 75/00;* C08F *8/00*
U.S. Cl. 525—112 **16 Claims**

1. An adhesive composition comprising

A. at least one polymeric material selected from the group consisting of:

(1) at least one olefinically unsaturated urethane reaction product of at least one isocyanate-functional prepolymer and at least one hydroxy-functional monomer having at least one unit of polymerizable olefinic unsaturation, said reaction product being characterized by the presence of at least two units of olefinic unsaturation and the substantial absence of free isocyanate groups;

(2) at least one butadiene-based elastomeric polymeric material selected from the group consisting of

(a) homopolymer of butadiene;

(b) copolymer of butadiene and at least one monomer copolymerizable therewith selected from the group consisting of styrene, acrylonitrile, methacrylonitrile and mixtures thereof;

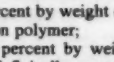
(c) modified elastomeric material selected from the group consisting of butadiene homopolymer and copolymer as previously described, such homopolymer and copolymer having been modified by copolymerization therein of trace amounts up to 5 percent by weight, based on weight of modified elastomeric material, of at least one functional monomer; and

(d) mixtures thereof;

(3) at least one polymer-in-monomer syrup consisting essentially of

(a) from 2 to 90 percent by weight of at least one polymerizable addition polymer;

(b) from 10 to 98 percent by weight of at least one polymerizable olefinically unsaturated monomeric compound having at least one



group; and

(c) from 0 to 30 percent by weight of a polymer containing the group $(CH_2CCl{=}CHCH_2)_n$, wherein n is an integer;

wherein (a) and (b) are present as a partial polymerization product of (b) or of (b) in the presence of (c); the mixture of (a) and (b), or of (a), (b) and (c), being a syrup of polymer dissolved or dispersed in unpolymerized monomer, in which syrup the amount of (a) derived from (b) is in the range from 2 to 90 percent by weight, based on the total weight of (a), (b) and (c);

(4) at least one polymeric material selected from the group consisting of polyvinyl alkyl ether, styreneacrylonitrile resin, unsaturated polyester resin and mixtures thereof, the alkyl moiety of said polyvinyl alkyl ether containing from one to 8 carbon atoms;

(5) at least one polymeric material selected from the group consisting of homopolymers of stryene, homopolymers of alkyl or hydroxyalkyl esters of acrylic and methacrylic acid, and copolymers of at least two different monomers selected from the group consisting of styrene and alkyl or hydroxyalkyl esters of acrylic or methacrylic acid, said esters of acrylic or methacrylic acid having from one to 18 carbon atoms in the alkyl moiety; and

(6) mixtures of such polymers;

B. at least one polymerizable material selected from the group consisting of styrene, acrylic or substituted acrylic monomer and mixtures thereof, the amount of such polymerizable monomer being in addition to any such monomer present in (A)(3);

C. at least one phosphorous-containing compound having at least one olefinically unsaturated group and at least one P—OH group;

D. at least one epoxy resin; and

E. room temperature-active redox couple catalyst system;

wherein said epoxy resin is present in an amount of one to 5 epoxide equivalents per equivalent of P—OH group.

4,467,072

RESINOUS COPOLYMER INSULATING COMPOSITIONS

James D. B. Smith, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 174,329, Aug. 1, 1980, Pat. No. 4,349,651. This application May 3, 1982, Ser. No. 374,583
Int. Cl.³ C08L *63/00*
U.S. Cl. 525—117 **5 Claims**

1. A curable composition comprising:

(A) a water soluble addition copolymer, consisting of the uncatalyzed reaction product of: (1) a first component electron rich monomer selected from the group consisting of N-vinyl-imidazole, 2-methyl-1-vinylimidazole, N-vinylcarbazole, N-vinylindole, and their mixtures, and (2) a second component monomer selected from the group consisting of maleic anhydride, fumaronitrile, tetracyanoethylene, maleimide, and their mixtures, where the average mol. ratio of first component monomer:second component monomer is about 1:1, and

(B) an epoxy resin, wherein the addition copolymer is mixed with epoxy resin in the weight ratio of from 6 parts to 60 parts epoxy resin per 1 part of addition copolymer.

4,467,073

TRANSPARENT ANTI-FOG COATING COMPOSITIONS

Walter S. Creasy, Bridgewater, N.J., assignor to Hydromer, Inc., Whitehouse, N.J.

Filed Oct. 20, 1982, Ser. No. 435,461
Int. Cl.³ C08F *8/30*
U.S. Cl. 525—127 **14 Claims**

1. An anti-fog liquid coating composition comprising:

a polymer which is polyvinylpyrrolidone, a polyvinylpyrrolidone copolymer with a polymerizable alpha olefin free of functional groups reactive with isocyanates or polydimethylacrylamide,

a polyisocyanate prepolymer,

a surfactant which will bond to a reaction product of the polymer and prepolymer, and

an organic solvent to form a solution of the foregoing ingredients.

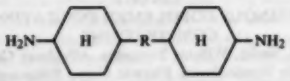
4,467,074

FLUOROELASTOMER COMPOSITION

Masahiko Oka, Otsu; Hideo Kano, Settsu, and Yutaka Ueta, Toyonaka, all of Japan, assignors to Daikin Kogyo Company, Limited, Osaka, Japan

Filed Aug. 18, 1982, Ser. No. 409,084
Claims priority, application Japan, Aug. 28, 1981, 56-135908
Int. Cl.³ C08F *8/30*
U.S. Cl. 525—356 **4 Claims**

1. In a fluoroelastomer composition comprising a fluoroelastomer, an acid acceptor and a curing agent, the improvement which comprises employing as a curing agent a hydrofluoric acid salt of a diamine compound of the general formula:



wherein R is a straight or branched alkylene group having 1 to 5 carbon atoms.

4,467,075

SURFACE TREATMENT OF A SOLID POLYMERIC MATERIAL WITH A REACTIVE GAS

Gregorio Tarancon, South Plainfield, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 5, 1983, Ser. No. 520,599
Int. Cl.³ C08J *3/00, 7/12*
U.S. Cl. 525—356 **4 Claims**

1. In a batch process for the treatment of the surface of a solid polymeric material by a gas reactive therewith comprising the following steps:

(a) providing a closed system comprising a chamber;
(b) introducing the material into the chamber;
(c) heating the chamber and the material to a selected temperature in the range of about 100° F. to about 200° F.;
(d) evacuating the system;
(e) introducing the reactive gas into the system in an amount (i) of up to about 10 percent in excess of the theoretical amount of gas required to react with the surface of the polymeric material to a desired depth and (ii) sufficient to provide a partial pressure in the system in the range of about 0.1 psia to about 3 psia;
(f) introducing an inert gas into the system in an amount sufficient to provide a total pressure in the system of about one atmosphere;
(g) maintaining the selected temperature for a period of time sufficient for the reaction to take place between the gas and the surface;
(h) evacuating the system;
(i) introducing air into the system to provide about atmospheric pressure; and
(j) removing the material,

the improvement comprising carrying out the following step prior to step (c):

providing an electrostatic charge on the surface of the solid polymer material by contact or induction manner that the charge is maintained throughout steps (c) through (g).

4,467,076

GRAFT POLYMERS OF POLYPHENYLENE OXIDE WITH ACRYLONITRILE AND STYRENE

Shunitsu Miyashita, Kobe, and Akiyoshi Somemiya, Akashi, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 26, 1982, Ser. No. 352,589
Claims priority, application Japan, Mar. 4, 1981, 56-31721
Int. Cl.³ C08F *283/08*
U.S. Cl. 525—391 **10 Claims**

1. A graft copolymer consisting essentially of (i) a substrate of a polyphenylene oxide and (ii) a superstrate which comprises at least one acrylonitrile and at least one styrene, wherein said copolymer does not form an observable precipitate after 48 hours of a methylene chloride-test wherein a solution of 5 w/v% of the graft copolymer in methylene chloride is allowed to stand at 23° C.

4,467,077

MICA FILLED POLYOLEFIN RESIN COMPOSITES

Fred J. Meyer, Chelsea, and Seymour Newman, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 970,822, Dec. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,287, Nov. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 783,505, Mar. 31, 1977, abandoned. This application Mar. 2, 1981, Ser. No. 239,229
Int. Cl.³ C08K *3/34, 5/02*
U.S. Cl. 524—449 **38 Claims**

1. A silane-free composite made by a process which comprises:

A. providing a blend consisting essentially of melt forming resin made from monomers comprising olefinic hydrocarbon monomers, mica and a strengthening amount of an additive that is a minor amount by weight of the combined weight of the resin and mica, the additive consisting essentially of one or more chlorinated aliphatic compounds having a molecular weight of about 250–10,000 and about 5–80% chlorine by weight;
B. maintaining the silane-free blend of step A as a melt at a temperature in a range between about 170°–300° C. for a time sufficient to strengthen the composite; and
C. cooling said silane-free blend to a temperature below the softening point of said composite.

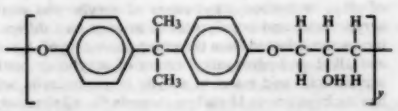
4,467,078

ELECTRON BEAM CURABLE POLYURETHANE COMPOSITIONS

Edmond G. Kolycheck, Lorain, and Laura L. Tolle, Richfield, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 404,152, Aug. 2, 1982,. This application Nov. 3, 1983, Ser. No. 548,385
Int. Cl.³ C08F *283/06;* C08G *65/32;* C08L *75/04*
U.S. Cl. 525—455 **2 Claims**

1. An electron beam-curable composition comprising (A) 100 weight parts of a polyurethane reaction product of (1) hydroxyl terminated polyesters, polyethers, polycarbonates, polylactones or, polyhydrocarbon macropolyols, (2) unsaturated polyethers having an average of ½ to 5 double bonds per molecule selected from the group consisting of polyethers having one terminal hydroxyl group and one terminal double bond group and polyether glycols having pendant double bond groups, and (3) an organic diisocyanate, and (B) from about 2 to about 100 parts by weight of a thermoplastic, linear copolymer of bisphenol A and epichlorohydrin, said copolymer having the molecular structure



where y is a number of such magnitude that the molecular weight of said copolymer is within the range of about 20,000 to about 40,000 and (C) one to 25 parts of a liquid acrylate or alkacrylate terminated polyurethane.

4,467,079

CURING COMPOSITIONS CONTAINING REDOX INDICATORS

Dieter A. Hechenberger, Sinsheim, and Hans J. Gollub, Buehl, both of Fed. Rep. of Germany, assignors to Lingner & Fischer GmbH, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,064

Claims priority, application United Kingdom, Nov. 13, 1981, 8134288

Int. Cl.[3] C08K 5/13; C09J 5/04

U.S. Cl. 526—90 7 Claims

1. In a two-component curing composition consisting of two components, in which one of than initiator of polymerisation, and the other component comprises an accelerator of polymerisation, the improvement wherein the composition further comprises a redox indicator having E_o from above +0.01 to below +0.76 volts and R_H from 13.5 to 28.

4,467,080

PROCESS FOR POLYMERIZATION IN A GASEOUS PHASE USING HETEROGENEOUS CATALYSIS AND A SPHERICAL REACTOR FOR CARRYING OUT THE PROCESS

Claude Brun, Idron Bizanos, and Robert Pelletier, Billere, both of France, assignors to Ato Chimie, Courbevoie, France

Filed Nov. 29, 1982, Ser. No. 444,872

Claims priority, application France, Nov. 30, 1982, 81 22425

Int. Cl.[3] C08F 2/34

U.S. Cl. 526—62 17 Claims

1. Process for polymerization in a gaseous phase using heterogeneous catalysis by putting at least one monomer, gaseous under the conditions of the reaction in contact with a solid catalyst, in an agitated polymerization zone, said process comprising employing a polymerization zone defined by a spherical wall, and effecting the agitation by means of a turbine unit having blades and driven in rotation, said blades extending along said wall in 10 to 60% of its surface, the catalyst particles and the growing polymer powder being driven by centrifugal force in at least a part of the spherical wall and falling back in the central part of the spherical zone whereby an thorough and uniform mixing is achieved without dead zones.

4,467,081

GELABLE, SILICATE RICH RESINS FROM HYDROPHOBIC POLYOLS AND VOLATILE AND/OR INCOMPATIBLE ORGANOSILICATES

Wen-Hsuan Chang; David T. McKeough, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1983, Ser. No. 462,572

Int. Cl.[3] C08G 77/04

U.S. Cl. 528—26 19 Claims

1. A liquid composition comprising a reaction product prepared by partially reacting to homogeneity:

(A) at least one hydrophobic polyol essentially free of modification by fatty acid; and

(B) an organosilicon-containing material comprising

(1) at least one organosilicon-containing substance free of functional groups attached directly to carbon and essentially free of alkali metal ions, having atoms bonded directly to Si, all of said atoms being selected from the group consisting of O, N and/or Cl, said organosilicon-containing substance additionally having moieties directly bonded to Si which are easily displaceable by reaction with water and/or alcohol, wherein at least a part of said organosilicon-containing substance is hydrolyzed to a compound or mixture of compounds, said compound or mixture of compounds containing a residual amount of the moieties directly bonded to Si which are easily displaceable by reaction with water and/or alcohol;

(2) optionally a nonfunctional organosilane, a hydrolyzed nonfunctional organosilane, or a mixture thereof; and

(3) optionally a functional organosilane, a hydrolyzed functional organosilane, or a mixture thereof;

wherein said reaction product is homogeneous and contains (i) residual moieties from the organosilicon-containing material which are directly bonded to Si and are easily displaceable by reaction with water and/or alcohol and (ii) residual hydroxyl moieties from the hydrophobic polyol; and said reaction product is capable of self curing to a continuous film by reaction of (i) said residual moieties from the organosilicon-containing material which are directly bonded to Si and are easily displaceable, with moisture and/or with (ii) said residual hydroxyl moieties from the hydrophobic polyol.

4,467,082

ORGANOPOLYSILOXANE PHOTOSENSITIZERS AND METHODS FOR THEIR PREPARATION

Akihiko Shirahata, and Keiichi Kishimoto, both of Chiba, Japan, assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 15, 1982, Ser. No. 358,401

Int. Cl.[3] C08G 77/00

U.S. Cl. 528—43 16 Claims

11. A method for preparing an organopolysiloxane photosensitizer comprising an average of more than two siloxane units, of which an average of at least one siloxane unit per organopolysiloxane molecule has the formula $Q_aR_b^4SiO_{(4-a-b)/2}$, said method comprising

(A) reacting, by a hydrosilylation reaction to form an adduct, an alkenyloxybenzophenone reactant having the formula

$$(R_m^1C_6H_{5-m})\overset{O}{\overset{\|}{C}}(C_6H_{4-n}R_n^2OR^5)$$

and a silane bearing at least one silicon-bonded hydrogen atom and at least one silicon-bonded hydrolyzable group or a siloxane bearing at least two siloxane units and at least one silicon-bonded hydrogen atom; and

(B) polymerizing the adduct or copolymerizing the adduct with another silane bearing at least one silicon-bonded hydrolyzable radical or with a siloxane, both being free of Q groups, to provide the organopolysiloxane photosensitizer, wherein Q denotes a benzophenone-containing group having the formula

$$(R_m^1C_6H_{5-m})\overset{O}{\overset{\|}{C}}(C_6H_{4-n}R_n^2OR^3)-;$$

at each occurrence R^1 and R^2 denote, independently, a hydrogen atom, a halogen atom, a monovalent hydrocarbon group having from 1 to 10 carbon atoms, an alkoxy group, a thioalkoxy group, a hydroxyl group, an amino group or a dialkylamino group; R^3 denotes a divalent hydrocarbon group having from 2 to 10 carbon atoms; R^4 denotes a monovalent hydrocarbon group or a halogenated monovalent hydrocarbon group; R^5 denotes an aliphatically unsaturated monovalent hydrocarbon group having the same number of carbon atoms as the R^3 group; m is an integer of from 1 to 5, n is an integer of from 1 to 4, a is an integer of from 1 to 3, b is an integer of from 0 to 2 and a+b is an integer of from 1 to 3; the R^5 group becoming the R^3 group during said hydrosilylation reaction.

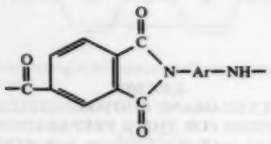
4,467,083

COPOLYAMIDE-IMIDES

Steven J. Grossman, Cheshire, and Kemal Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

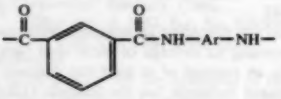
Filed Oct. 3, 1983, Ser. No. 538,457
Int. Cl.³ C08G 18/34
U.S. Cl. 528—49 7 Claims

1. A thermoplastic copolyamide-imide characterized by a molecular weight represented by an inherent viscosity (as a 0.5 percent weight by weight solution in dimethylformamide) of 0.5 to 0.9 dL/g. and a heat deflection temperature of at least 170° C. and further characterized in that, of the total recurring units in the molecule, from 30 to 40 percent correspond to the formula



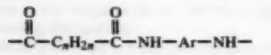
(I)

from 26 to 44 percent correspond to the formula



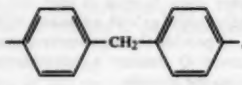
(II)

and the remainder, but not more than 32 percent, correspond to the formula



(III)

wherein Ar in all instances represents a divalent aromatic moiety of which from 0 to 10 percent in any instance are selected from the group consisting of tolylene-2,4, tolylene-2,6 and mixtures thereof and from 90 to 100 percent are of the formula



and wherein C_nH_{2n} represents alkylene having from 7 to 10 carbon atoms.

4,467,084

SHRINKABLE POLYAMIDE FILM AND PROCESS FOR ITS PRODUCTION

Kiyoshi Kitagawa, Hirakata, and Atsushi Komatsuzaki, Ohtsu, both of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Division of Ser. No. 361,242, Mar. 24, 1982, Pat. No. 4,431,705. This application Sep. 7, 1983, Ser. No. 530,104
Claims priority, application Japan, Apr. 14, 1981, 56-56486; Apr. 14, 1981, 56-56487
Int. Cl.³ C08G 69/02
U.S. Cl. 528—324 1 Claim

1. A biaxially stretched shrinkable polyamide film consisting essentially of a copolymer of 6, 6-nylon/6-nylon in a weight ratio within the range of from 5/95 to 25/75, having a hydrothermal shrinking ratio of at least 30% in both MD and TD, and a hydrothermal shrinking stress of from 300 to 700 g/mm².

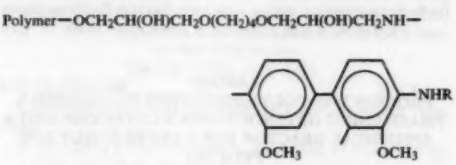
4,467,085

CHEMICAL COMPOUNDS, PROCESS FOR THEIR PREPARATION, AGENTS CONTAINING THESE COMPOUNDS, AND THEIR USE

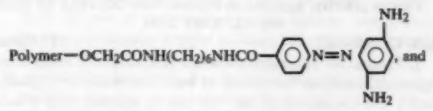
Gerhard Scharf, Hoechst Aktiengesellschaft, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany, assignor to Gerhard Scharf, Fed. Rep. of Germany

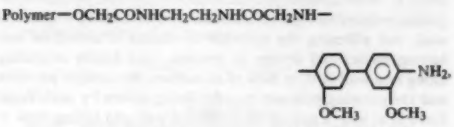
Filed Apr. 28, 1981, Ser. No. 258,408
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016618
Int. Cl.³ C12Q 1/26, 1/28, 1/54; C08B 11/00
U.S. Cl. 536—43 12 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein R is H or—CH_2CH_2OH,





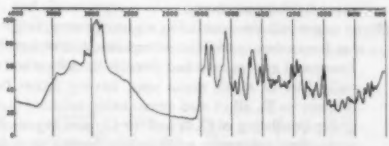
wherein said Polymer is insoluble.

4,467,086

CEPHALOSPORIN ANTIBIOTIC

Thomas Miller, Harefield, England, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 185,967, Sep. 9, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,519
Claims priority, application United Kingdom, Oct. 2, 1979, 7934203
Int. Cl.³ C07D 501/46
U.S. Cl. 544—25 1 Claim



1. ((6R,7R)-7-[(Z)-2-(2-Aminothiazol-4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)ceph-3-em-4-carboxylate in the form of a crystalliine bishydrochloride which substantially exhibits the following 'd' values and relative intensities when subjected to Debye Scherrer powder X-ray diffraction using CoKα radiation: 'd' value Relative intensity 'd' value Relative intensity

(Å)	$\left(\frac{I}{I_{100}}\right)$		(Å)	$\left(\frac{I}{I_{100}}\right)$
10.6	93		2.76	12
7.9	22		2.73	10
6.6	30		2.65	15
6.4	10		2.59	5
5.65	45		2.53	3
5.43	15		2.48	7
5.07	10		2.43	10
4.90	10		2.39	trace
4.70	12		2.35	7
4.54	10		2.26	10
4.25	100		2.24	trace
4.12	30		2.19	4
3.97	30	diffuse	2.11	2
3.89	65		2.09	4
3.82	25		2.06	2
3.75	35		2.03	2
3.60	35		1.963	2
3.51	35		1.919	2
3.34	10	diffuse	1.886	1
3.26	18	diffuse	1.870	1
3.07	25		1.836	1
2.95	22		1.812	1
2.87	5		1.776	1
2.81	10		1.748	1.

4,467,087

1,2,4-TRIAZINES

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

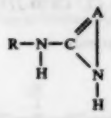
Division of Ser. No. 206,819, Nov. 14, 1980, Pat. No. 4,374,251, which is a division of Ser. No. 7,755, Jan. 30, 1979, Pat. No. 4,260,744, which is a division of Ser. No. 778,812, Mar. 17, 1977, Pat. No. 4,153,793, which is a division of Ser. No. 619,724, Oct. 6, 1975, Pat. No. 4,035,374, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Sep. 24, 1982, Ser. No. 422,806

Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 35551/73

Int. Cl.³ C07D *253/06, 401/06, 401/12, 417/12*

U.S. Cl. 544—182 **5 Claims**

1. A compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a 1,2,4-triazine ring, said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is a nitrogen containing heterocyclic ring selected from imidazole, pyridine, thiazole, isothiazole or thiadiazole, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,467,088

S-TRIAZINES

Hansrudolf Schwander, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

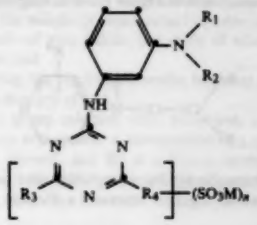
Division of Ser. No. 186,830, Sep. 12, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,592

Claims priority, application Switzerland, Sep. 24, 1979, 8604/79

Int. Cl.³ C07D *251/46, 251/52, 251/70*

U.S. Cl. 544—197 **1 Claim**

1. An amine of the formula



in which R_1 and R_2 independently of one another are C_{1-4}-alkyl, R_3 and R_4 independently of one another are one of the following radicals; C_{1-10}-alkoxy which is unsubstituted or substituted by alkoxy; N-C_{1-10}-alkylamino which is unsubstituted or substituted by phenyl; phenylamino which is unsubstituted or substituted by halogen, C_{1-4}-alkyl or C_{1-4}-alkoxy; naphthylamino which is unsubstituted or substituted by halogen, C_{1-4}-alkyl or C_{1-4}-alkoxy; halogen; N-phenyl-N-alkylamino; dialkylamino; alkylmercapto; cyclohexyloxy; N-alkyl-N-cyclohexylamino and cyclohexylamino, M is hydrogen or one equivalent of a cation and n is 1 or 2.

4,467,089

CARBAMATE AND CARBONATE SALTS OF TERTIARY AMINES

Ibrahim S. Bechara, Boothwyn, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 4, 1982, Ser. No. 354,844

Int. Cl.³ C07D *295/20, 295/02, 487/08, 233/10*

U.S. Cl. 544—351 **2 Claims**

1. The triethylene diamine salt of carbonic acid.
2. The bis(dimethylaminoethyl) ether salt of carbonic acid.

4,467,090

COMPOUND, 8-FLUORO-5-(P-FLUOROPHENYL)-2-[4-(P-FLUOROPHENYL)-4-HYDROXYBUTYRYL]-2,3,4,5-TETRAHYDRO-1H-PYRIDO[4,3-B]INDOLE

Stephen S. Massett, and Harry A. Watson, Jr., both of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 425,152

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—85 **1 Claim**

1. 8-Fluoro-5-(p-fluorophenyl)-2-[4-(p-fluorophenyl)-4-hydroxybutyryl]-2,3,4,5-tetrahydro-1H-pyrido[4,3-b]indole.

4,467,091
ACYL AMINO PYRIDINES

Edwin T. Edington, Cookham, and Alan C. White, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

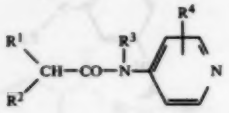
Division of Ser. No. 51,100, Jun. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 873,192, Jan. 30, 1978, Pat. No. 4,180,670. This application Jan. 28, 1983, Ser. No. 461,848

Claims priority, application United Kingdom, Feb. 2, 1977, 4354/77; Jul. 9, 1977, 28879/77

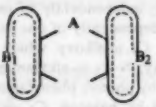
Int. Cl.³ C07D *495/04, 471/04, 213/75;* A61K *31/44*

U.S. Cl. 546—285 **2 Claims**

1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein R^1 and R^2 together represent a divalent group having the formula



wherein A is alkylene of 1 to 4 carbon atoms and each of B_1 and B_2 together with the two carbon atoms attached thereto represents a member selected from the group consisting of phenylene; naphthylene; phenylene substituted by one to two substituents selected from halogen, lower alkyl, lower alkoxy, lower alkylenedioxy and trifluoromethyl; pyridinediyl and thiophene-diyl, and R^3 and R^4 are independently selected from hydrogen and lower alkyl.

4,467,092
CARBAMATES AND THIOCARBAMATES OF 3-HYDROXY-4-PYRIDYLOXYPHENOXY ALKANOIC ACID ESTERS

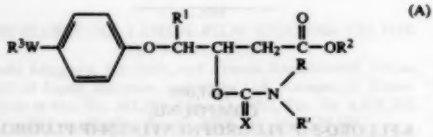
Gustave K. Kohn, Palo Alto, and Joe T. Bamberg, Redwood City, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Aug. 20, 1982, Ser. No. 410,174

Int. Cl.³ C07D *213/64*

U.S. Cl. 546—291 **5 Claims**

1. A compound of the following formula (A):



(A)

wherein,

R is lower alkyl or unsubstituted phenyl;

R' is hydrogen or lower alkyl;

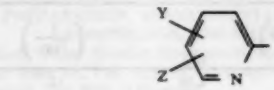
R^1 is hydrogen or lower alkyl;

R^2 is lower alkyl, lower alkenyl or lower alkynyl;

W is oxygen;

X is oxygen or sulfur; and

R^3 is



in which,

each of Y and Z is independently selected from hydrogen, trifluoromethyl, bromo, chloro and fluoro.

4,467,093
PROCESS FOR PREPARING A 1,4-DIHYDROPYRIDINE DERIVATIVE

Branko Jenko, Ljubljana-Polje, and Igor Langof, Ljubljana, both of Yugoslavia, assignors to LEK, Tovarna Farmacevtskih in Kemicnih Izdelkov, N.Sol.O., Ljubljana, Yugoslavia

Filed Jul. 27, 1982, Ser. No. 402,487

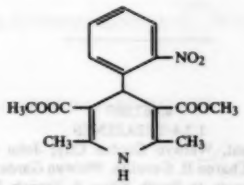
Claims priority, application Yugoslavia, Aug. 19, 1981, 2005/81

Int. Cl.³ C07D *213/55*

U.S. Cl. 546—321 **8 Claims**

1. A process for preparing 4-(2'-nitrophenyl-2,6-dimethyl)-3,5-dicarbomethoxy-1,4-dihydropyridine of the formula

I



which comprises reacting 2-nitrobenzaldehyde diacetate, methyl acetoacetate, and ammonia in the presence of an inert organic solvent at a temperature of between 20° C. and 150° C.

4,467,094
PRECURSORS TO ETHYLENEDIAMINE DERIVATIVES

Cesare Casagrande, Arese, and Giorgio Ferrari, Milan, both of Italy, assignors to Simes S.p.A., Milan, Italy

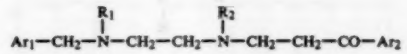
Division of Ser. No. 270,808, Jun. 5, 1981, Pat. No. 4,381,305. This application Dec. 3, 1982, Ser. No. 446,671

Claims priority, application Italy, Jun. 10, 1980, 22677 A/80

Int. Cl.³ C07D *213/36*

U.S. Cl. 546—334 **1 Claim**

1. A compound of formula



wherein

Ar_1 is a phenyl radical which may be substituted by one or more radicals selected from the group consisting of nitro, chlorine and methoxy, a phenylalkyl radical or a heterocyclic radical selected from the group consisting of furanyl, thienyl and pyridinyl,

Ar_2 is a phenyl radical which may be substituted by one or more radicals selected from the group consisting of chlorine, fluorine, methyl and methoxy,

R_1 is a hydrogen atom, a lower alkyl or a phenylalkyl radical,

R_2 is a lower alkyl radical.

4,467,095

ANTICHOLINERGIC COMPOUNDS

Gino R. Treves, and Burton M. Baum, both of Princeton, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 10, 1969, Ser. No. 800,350
Int. Cl.[3] C07D *211/70*
U.S. Cl. 546—342 2 Claims

1. The compound 4-(1-methyl-1,2,3,6-tetrahydropyridine)-methyl α-isopropyl-α-phenylglycolate.

2. The compound 4-(1-methyl-1,2,3,6-tetrahydropyridine)-methyl α-(1-cyclopentenyl)-α-phenylglycolate.

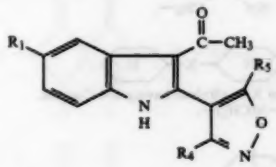
4,467,096

ISOXAZOLYL INDOLAMINES

Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 359,752, Mar. 19, 1982, Pat. No. 4,421,752, which is a division of Ser. No. 251,068, Apr. 6, 1981, Pat. No. 4,336,391. This application Aug. 22, 1983, Ser. No. 525,248
Int. Cl.[3] C07D *261/06*
U.S. Cl. 548—247 2 Claims

1. A compound of the formula



where R_1, represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms, and R_4 and R_5 each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms.

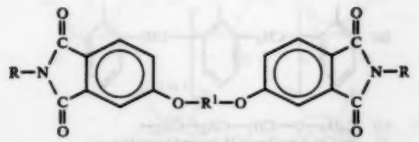
4,467,097

METHOD FOR MAKING AROMATIC BIS(ETHERIMIDE)S

John W. Verbicky, Jr., Scotia; James A. Cella, Clifton Park, and Elbridge A. O'Neil, Jr., Ballston Spa, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,388
Int. Cl.[3] C07D *209/48*
U.S. Cl. 548—461 10 Claims

1. A method for making aromatic bis(ether phthalimide)s of the formula

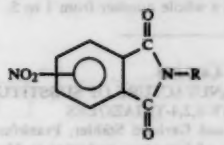


which comprises

(A) effecting reaction between an alkali bisphenoxide of the formula

$$X^1—O—R^1—O—X^2$$

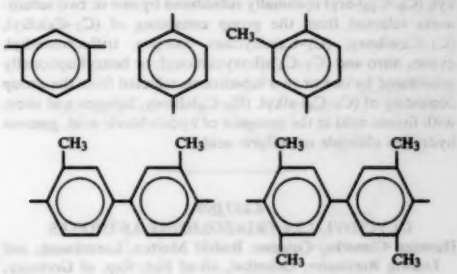
and a nitro-substituted N-alkyl phthalimide of the formula

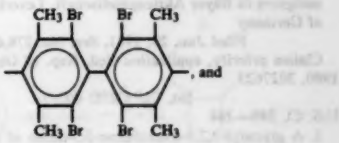


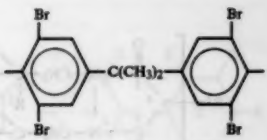
in the presence of a non-polar organic solvent, and an effective amount of a phase transfer catalyst in the form of a mixture of 5 to 20% by weight of dipolar aprotic solvent based on the weight of alkali metal bisphenoxide and 0.025 to 0.1 mole of zinc halide, per mole of alkali metal bisphenoxide and

(B) recovering the resulting aromatic bis(ether phthalimide) from the mixture of (A),

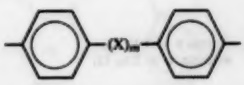
where R is a group selected from hydrogen, a $C_{(1-8)}$ alkyl group, a $C_{(6-13)}$ aryl group, a halogenated $C_{(6-13)}$ aryl group and mixtures thereof, and R^1 is a $C_{(6-30)}$ aromatic organic group selected from the class consisting of



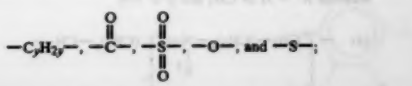




and divalent organic groups of the general formula,



where X is a member selected from the class consisting of divalent groups of the formula,



X^1 and X^2 can be the same or different alkali metal ions se-

lected from the class consisting of sodium, potassium or cesium; m is 0 or 1, and y is a whole number from 1 to 5.

4,467,098

PROCESS FOR THE MANUFACTURE OF SUBSTITUTED 3-HYDROXY-1,2,4-TRIAZOLES

Manfred Koch, Eppstein, and Gerhard Stühler, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,320

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114314; Apr. 9, 1981, 3114316

Int. Cl.³ C07D 249/12

U.S. Cl. 548—263 **13 Claims**

1. A process for manufacturing a 3-hydroxy-1,2,4-triazole, which comprises cyclizing a semicarbazide of the formula

$$R—NH—NH—CONH_2$$

wherein R is $(C_1–C_8)$alkyl, $(C_1–C_4)$alkoxy-$(C_1–C_4)$alkyl, cyano-$(C_1–C_4)$alkyl, halogeno-$(C_1–C_4)$alkyl, $(C_3–C_7)$-cycloalkyl; $(C_6–C_{10})$-aryl optionally substituted by one or two substituents selected from the group consisting of $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, $(C_1–C_4)$alkylthio, halogen, trifluoromethyl, cyano, nitro and $(C_1–C_4)$alkoxycarbonyl; or benzyl optionally substituted by one or two substituents selected from the group consisting of $(C_1–C_4)$-alkyl, $(C_1–C_4)$alkoxy, halogen and nitro, with formic acid in the presence of hydrochloric acid, gaseous hydrogen chloride or sulfuric acid.

4,467,099

GLYCIDYL-1,2,4-TRIAZOLIDINE-3,5-DIONES

Henning Giesecke, Cologne; Rudolf Merten, Leverkusen, and Ludwig Rottmaier, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

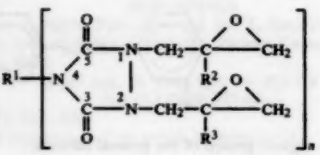
Filed Jun. 29, 1981, Ser. No. 278,646

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027623

Int. Cl.³ C07D 405/14

U.S. Cl. 548—264 **8 Claims**

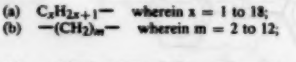
1. A glycidyl-1,2,4-triazolidine-3,5-dione of the formula



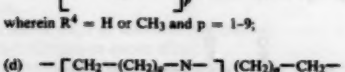
(I)

wherein R^1 is

(a) C_xH_{2x+1}— wherein x = 1 to 18;
(b) $-(CH_2)_m$— wherein m = 2 to 12;

(c)


wherein R^4 = H or CH_3 and p = 1–9;

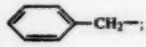
(d)


wherein R^5 = C_1–C_4-alkyl, q = 1–2 and r = 1–4;

-continued

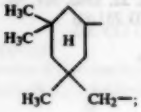
(e)

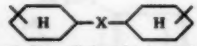
(f)

(g)


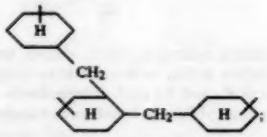
(h)

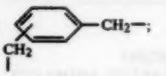
(i)

(j)


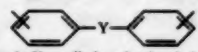
(k)


wherein X = alkylene having 1–4 C-atoms, O or $-N(CH_3)-$;

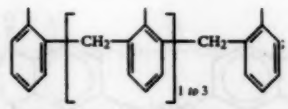
(l)


(m)


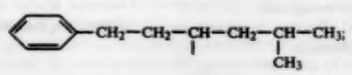
(n)

(o)


wherein Y = alkylene having 1–4 C-atoms, O or $-N(CH_3)-$;

(p)


(q) $C_4H_9—O—CH_2—CH_2—CH_2—$;
(r) $-(CH_2)_3—O—(CH_2)_{2\text{ to }4}—O—(CH_2)_3—$;

(s)


or one of said groups substituted by a member selected from the group consisting of alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety, CN, NO_2, alkylmercapto having 1

to 4 carbon atoms, dialkylamino having 1 to 6 carbon atoms in each alkyl moiety and halogen;

R^2 and R^3, which may be the same or different, are eachhydrogen or methyl and

n is a number from 1 to 5.

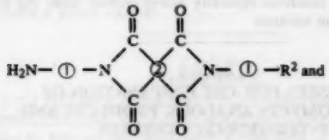
4,467,100

EPOXY RESIN COMPOSITIONS CURED WITH IMIDE-AMINE AT AMBIENT TEMPERATURES TO AFFORD PRODUCTS HAVING USEFUL PROPERTIES AT HIGH TEMPERATURES

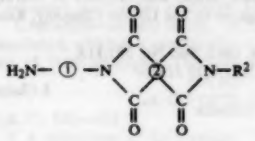
Raj N. Gounder, Robbinsville, N.J., and John T. Geary, Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Division of Ser. No. 267,149, May 26, 1981, Pat. No. 4,340,715.
This application Jul. 21, 1982, Ser. No. 400,327
Int. Cl.³ C07C *147/11, 65/00*
U.S. Cl. 548—429 **4 Claims**

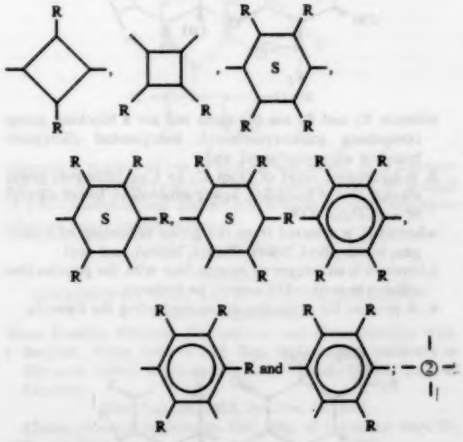
1. Imide-amine compounds having the structure



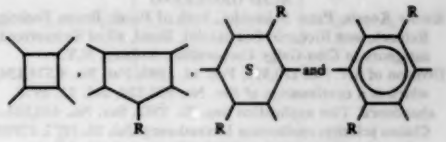
and



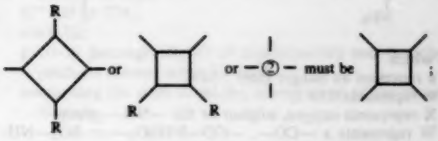
wherein —①— is a divalent cycloaliphatic or aromatic radical selected from the group consisting of



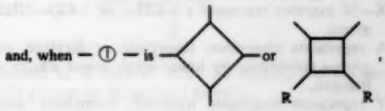
is a tetravalent cycloaliphatic or aromatic radical selected from the group consisting of



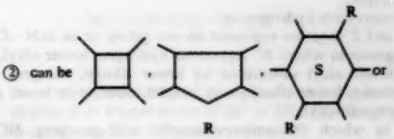
R and R^2 can be the same or different and each is selected from the group consisting of hydrogen, halogen, alkyl group having from 1 to 4 carbon atoms, hydroxyl; with the proviso that, in all cases, either — 1 — must be



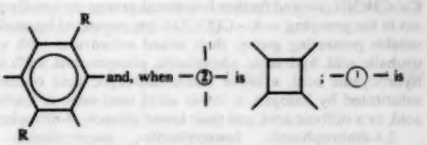
and, when —①— is

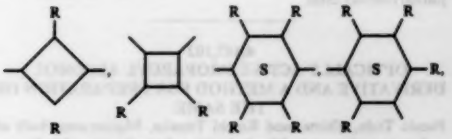


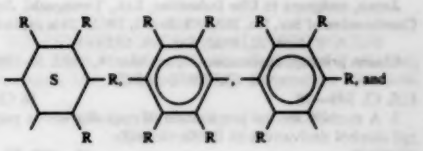
②— can be

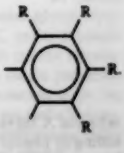


and, when —②— is









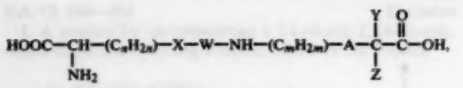
4,467,101
COMPOUNDS WITH TERMINAL AMINOCARBOXYLIC ACID GROUPING

Karoly Kocsis; Peter Schneider, both of Basel; Bruno Fechtig, Reinach, and Riccardo Scartazzini, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 120,591, Feb. 11, 1980, Pat. No. 4,374,134, which is a continuation of Ser. No. 923,524, Jul. 11, 1978, abandoned. This application Sep. 20, 1982, Ser. No. 420,534
Claims priority, application Luxembourg, Jul. 18, 1977, 77788
Int. Cl.³ C07D *333/24;* **C07C** *153/00, 143/52, 147/13*
U.S. Cl. 549—76 **15 Claims**

1. Compounds of the formula

(III)



in which
n represent an integer from 1 to 4,
m represents 0 or 1,
X represents oxygen, sulphur or the —NH— group,
W represents a —CO—, —CO—$NHSO_2$— or SO_2—NH-SO_2— group, or
X—W together represent a —CO— or —CO—$NHSO_2$— group,
A represents phenylene, thienylene or furylene, or such groups substituted by lower alkyl, lower alkoxy and/or halogen,
Y represents hydrogen, hydroxyl, formyloxy, amino or sulpho,
Z represents hydrogen, or
Y and Z together represent an oxo group or an =N—OR° group in which R° represents hydrogen, lower alkyl, or lower alkyl substituted by lower alkoxy, halogen, hydroxy, lower alkanoyloxy, sulpho, carboxy or lower alkoxycarbonyl,
and in which the aminocarboxylic acid grouping HOOC—CH(NH_2)— and further functional groups optionally present in the grouping —A—C(Y)(Z)— are protected by an eliminatable protecting group, their mixed anhydrides with a hydrohalic acid, hydrazoic, phosphoric, phosphorous, sulfuric or hydrocyanic acid, a lower alkanecarboxylic acid optionally substituted by halogen, a lower alkyl semi-ester of carbonic acid, or a sulfonic acid, and their lower alkenol-, 4-nitrophenyl-, 2,4-dinitrophenyl-, benzotriazole-, succinylimino- or phthalylimino ester.

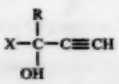
4,467,102
OPTICALLY ACTIVE PROPARGYL ALCOHOL DERIVATIVE AND A METHOD FOR PREPARATION OF THE SAME

Fumio Toda, Ehime, and Koichi Tanaka, Matsuyama, both of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 383,580, Jun. 1, 1982,. This application Nov. 21, 1983, Ser. No. 553,644
Claims priority, application Japan, Mar. 4, 1982, 57-33011
Int. Cl.³ C07D *333/00*
U.S. Cl. 549—78 **16 Claims**

1. A method for the preparation of optically active propargyl alcohol derivatives of the formula (I):

(I)



wherein X represents a member selected from the group consisting of phenyl and thienyl radicals and R represents a member selected from the group consisting of lower alkyl radicals, halogenated methyl radicals, a phenyl radical and substituted phenyl radicals each having at least one substituent selected from the group consisting of lower alkyl radicals and halogen atoms, which method comprises the steps of:

bringing a racemic modification of l- and d-propargyl alcohol derivatives of the formula (I) into contact with l-brucine in an organic solvent, whereby a mixture of diastereomers of L-brucine with an l-isomer and a d-isomer of a propargyl alcohol derivative of the formula (I) is produced and one of said diastereomers deposits from said organic solvent
and the other one is dissolved in said organic solvent;

separating said deposited diastereomer from the solution containing the other diastereomer;

decomposing each of said diastereomers to dissociate l-brucine from the corresponding optically active isomer of the propargyl alcohol derivative of the formula (I) in the presence of an organic solvent which is capable of dissolving said corresponding optically active isomer and is incompatible with water by bringing each diastereomer into contact with an aqueous solution of a mineral acid; whereby the resulting optically active isomer is dissolved in the water-incompatible organic solvent and the dissociated l-brucine is dissolved in the aqueous mineral acid solution; and

isolating the resultant optically active isomer from the decomposition mixture.

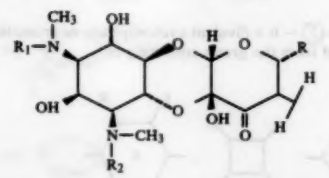
4,467,103
PROCESSES FOR THE PREPARATION OF SPECTINOMYCIN ANALOGS, PRODUCTS AND INTERMEDIATES THEREIN

David R. White, Kalamazoo, Mich., and Clarence J. Maring, New Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 24, 1982, Ser. No. 381,113
Int. Cl.³ C07D *323/04*
U.S. Cl. 549—361 **5 Claims**

1. A compound of the formula:

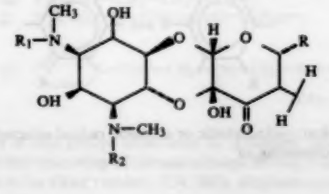
I



wherein R_1 and R_2 are the same and are a blocking group comprising aralkoxycarbonyl, halogenated alkoxycarbonyl or alkoxycarbonyl, and
R is hydrogen, alkyl of from C_1 to C_{20}, inclusive, lower alkenyl, lower haloalkyl, lower aminoalkyl, lower alkynyl or —$(CH_2)_n$—OX
wherein X is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, benzyl, and acyl
wherein n is an integer of zero to four with the proviso that when n is zero —OX cannot be hydroxy.

4. A process for preparing an enone having the formula:

I

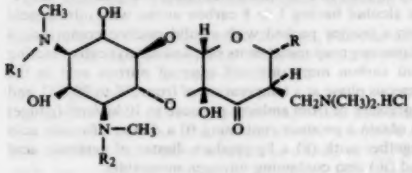


wherein R_1 and R_2 are the same and are a blocking group comprising aralkoxycarbonyl, halogenated alkoxycarbonyl or alkoxycarbonyl, and

R is hydrogen, alkyl of from C_1 to C_{20}, inclusive lower alkenyl, lower haloalkyl, lower aminoalkyl, lower alkynyl or $-(CH_2)_n-OX$

wherein X is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, benzyl, and acyl

wherein n is an integer of zero to four with the proviso that when n is zero —OX cannot be hydroxy and pharmacologically acceptable salts thereof which comprises a β-elimination in which sodium cyanoborohydride is added to a Mannich base having the formula:



III"

wherein R, R_1 and R_2 are as defined above in a solvent comprising a lower alcohol.

4,467,104

ESTERS OF 2-(2-CHLOROCARBONYL)-2-(2,3-DIHYDRO-2-ALKYL-BENZOFURAN-7-YL)-HYDRAZINECARBOXYLIC ACID

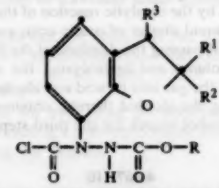
Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 276,303, Jun. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 187,235, Sep. 15, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,163

Int. Cl.³ C07D 307/79

U.S. Cl. 549—462 **3 Claims**

1. A compound of the formula:



wherein R is alkyl of one or two carbon atoms, or is 2-propynyl, R^1 is hydrogen or alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 3 carbon atoms, and R^3 is hydrogen, middle halogen or alkyl of 1 to 3 carbon atoms.

4,467,105

METHOD OF PREPARING GLYCOL ESTERS OF ORGANOSILANES

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

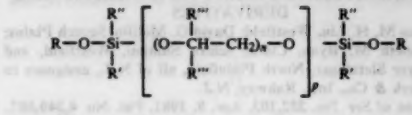
Filed Sep. 24, 1982, Ser. No. 422,612

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138835

Int. Cl.³ C07F 7/04, 7/18, 7/08

U.S. Cl. 556—444 **7 Claims**

1. A process for the preparation of an organosilane ester of a polyol of the formula



wherein

R=a glycol substituent of the general formula

$$-(CH_2-CH-O)_q-R'''', (R'''' = C_1-C_4\text{—alkyl; } q = 1\text{–}10);$$
$$\quad\quad R'''$$

R'=RO— or a substituent from group R";

R"=alkyl (C_1–C_{20}), branched or unbranched, alkenyl, cycloalkyl or aryl;

R'''=H or CH_3;

n=1–12;

p=0–10 (average degree of condensation) and branched products thereof when R'=RO—,

comprising the steps of mixing silicon esters of the general formula

$$(R-O)_2-Si-R'' \quad\quad (VI)$$
$$\quad\quad\quad R'$$

wherein R, R' and R" have the meanings given above with glycols of the general formula

$$HO-(CH-CH_2-O-)_nH \quad\quad (III)$$
$$\quad\quad R'''$$

in a ratio predetermined by the selected condensation degree p, at temperatures of 20° to 220° C., allowing the resulting reaction mixture to react; and

removing, from the reaction mixture, the glycol monoalkyl ethers of the general formula

$$H-(O-CH-CH_2-)\,OR'''' \quad\quad (IV)$$
$$\quad\quad\quad R'''$$

which are formed.

4,467,106

POLYETHER/POLYESTER GLYCOL PROCESS

Sundar J. Rajan, Ferndale, Mich., and Edmund F. Perozzi, Crestwood, Mo., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 15, 1982, Ser. No. 368,741

Int. Cl.³ C07C 69/88

U.S. Cl. 560—72 **26 Claims**

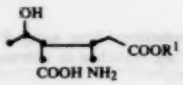
1. A process for forming a polyether/polyester glycol comprising heating a glycol to about 150°–250° C. under pressure of a gas containing at least about 5% by weight carbon monoxide at about 500–2,000 psi in the presence of a halide promoter and a ruthenium catalyst, said glycol being selected from the group consisting of straight chain alkylene, branched alkylene, and cycloalkylene glycols, and recovering therefrom an intermediate molecular weight polyether/polyester glycol.

4,467,107
1-HYDROXYETHYL-2-AMINO PENTANEDIOIC ACID DERIVATIVES

Thomas M. H. Liu, Westfield; David G. Melillo, Scotch Plains; Kenneth M. Ryan, Clark; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 252,103, Apr. 8, 1981, Pat. No. 4,349,687, which is a continuation of Ser. No. 112,021, Jan. 14, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,421
Int. Cl.³ C07C *101/20*
U.S. Cl. 560—170 3 Claims

1. A compound having the formula:



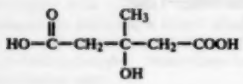
wherein R^1 is alkyl having from 1–6 carbon atoms, aryl, aralkyl having 7–12 carbon atoms or β,β,β-trichloroethyl.

4,467,108
PROCESS FOR THE PREPARATION OF 3-METHYL-3-HYDROXY-GLUTARIC ACID

Guiseppe Gigliotti, Paris, and Jean-Michel Roul, Chelles, both of France, assignors to Roussel Uclaf, Paris, France

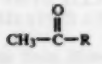
Filed May 27, 1983, Ser. No. 498,834
Claims priority, application France, Jun. 17, 1982, 82 10597
Int. Cl.³ C07C *69/66*
U.S. Cl. 560—180 8 Claims

1. A process for the preparation of 3-methyl-3-hydroxy-glutaric acid of the formula



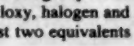
I

comprising reacting a compound of the formula



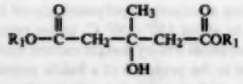
II

wherein R is selected from the group consisting of alkoxy of 1 to 6 carbon atoms, formyloxy, halogen and acyloxy of 2 to 18 carbon atoms with at least two equivalents of a compound of the formula



III

wherein X is an alkali metal and R_1 is alkyl of 1 to 6 carbon atoms to obtain a compound of the formula



IV

and subjecting the latter to saponification or optionally catalytic thermal decomposition to obtain 3-methyl-3-hydroxy-glutaric acid.

4,467,109
PROCESS FOR CONTINUOUS PREPARATION OF DIESTER OF OXALIC ACID

Susumu Tahara; Kozo Fujii; Keigo Nishihira; Masaoki Matsuda, and Katsuhiko Mizutare, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Continuation of Ser. No. 293,702, Aug. 17, 1981, abandoned. This application May 19, 1983, Ser. No. 495,460
Claims priority, application Japan, Aug. 29, 1980, 118343
Int. Cl.³ C07C *69/34*
U.S. Cl. 560—193 18 Claims

1. A process for the continuous preparation of a diester of oxalic acid, which comprises

(1) a first step of passing gas containing carbon monoxide and an ester of a saturated monohydric aliphatic or alicyclic alcohol having 1 to 8 carbon atoms with nitrous acid into a reactor packed with a solid catalyst comprising a platinum group metal or its salt, and catalytically reacting said carbon monoxide and ester of nitrous acid in the gaseous phase at a temperature of from 50° to 200° C. and a pressure of from ambient pressure to 10 kg/cm² (gauge) to obtain a product containing (i) a diester of oxalic acid together with (ii) a by-product diester of carbonic acid and (iii) also containing nitrogen monoxide;

(2) a second step of passing the product of the first step to a condenser to separate said product into a non-condensed gas containing nitrogen monoxide formed by the catalytic reaction of the first step from a condensed liquid containing (i) the diester of oxalic acid together with (ii) said by-product diester of carbonic acid;

(3) a third step of passing the non-condensed gas of the second step to a regeneration column and therein contacting it with a gas containing molecular oxygen and an alcohol to react with nitrogen monoxide in said non-condensed gas to regenerate said ester of nitrous acid as the regeneration gas and to provide a concentration of nitrogen monoxide in said regeneration gas withdrawn from the regeneration column of from 2 to 7% by volume, and recycling said regeneration gas containing said ester of nitrous acid to the reactor of the first step;

(4) a fourth step of passing the condensed liquid of the second step to a distillation column and distilling out an alcohol containing said diester of carbonic acid formed as a by-product by the catalytic reaction of the first step, and obtaining a liquid diester of oxalic acid; and

(5) a fifth step of passing the distillate of the fourth step to a hydrolysis column and hydrolyzing the diester of carbonic acid in the gas into its acid and alcohol components and recycling the alcohol thereby obtained to the third step as an alcohol source for the third step.

4,467,110
PROCESS FOR PURIFICATION OF CRUDE TEREPHTHALIC ACID

Imre Puskas, Glen Ellyn, and David E. James, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 316,338, Oct. 29, 1981, Pat. No. 4,394,299. This application Feb. 15, 1983, Ser. No. 466,651
Int. Cl.³ C07C *51/42*
U.S. Cl. 562—487 12 Claims

1. A process for purifying crude terephthalic acid containing up to 10,000 ppm of 4-carboxybenzaldehyde wherein said 4-carboxybenzaldehyde content is decreased to less than 100 ppm and p-toluic acid content increase is minimized which comprises hydrogenating said crude acid at a temperature of from about 100° C. to about 300° C. and a pressure of from 200 to 1500 psi with hydrogen in the presence of a catalyst composition which comprises crystallites of palladium and rhodium adsorbed on a porous activated carbon support material, said support having a surface area of at least 600 m^2/g, wherein said catalyst composition is prepared by contacting said support with (a) an aqueous solution of an amine and a palladium salt in

the presence of an organic carboxylic acid wherein concentration of said amine is sufficient to solubilize said palladium salt and mole ratio of said acid to said amine is at least 0.75 and with (b) an aqueous solution of a rhodium compound and an alkali metal nitrite wherein penetration of said palladium and rhodium crystallites into said porous support is within the range of from about 70 to 150 micrometers of the surface of said support.

4,467,111

PROCESS FOR PURIFICATION OF CRUDE TEREPHTHALIC ACID

Imre Puskas, Glen Ellyn, and David E. James, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 316,337, Oct. 29, 1981, Pat. No. 4,421,676. This application Jul. 21, 1983, Ser. No. 515,796

Int. Cl.³ C07C *51/42*

U.S. Cl. 562—487 **6 Claims**

1. A process for purifying crude terephthalic acid containing up to 10,000 ppm of 4-carboxybenzaldehyde wherein 4-carboxybenzaldehyde content is reduced to a level of less than 100 parts per million in a standard laboratory test wherein said process comprises hydrogenating said crude acid in liquid phase at a temperature of from about 100° C. to about 300° C. and a pressure of from about 200 to about 1500 psi with hydrogen in the presence of water and of a catalyst composition which comprises crystallites of catalytically active palladium upon the surface of a porous activated carbon support material having a surface area of at least 600 m^2/g wherein said crystallites are predominantly less than 35 Å in longitudinal measurement, and wherein said catalyst composition is prepared by contacting said support with an aqueous solution of a nitritopalladate salt.

4,467,112

PROCESS FOR PRODUCING P-N-ALKYLBENZOIC ACID

Ryo Matsuura, Yamato; Kazuya Nagaoka, Yokohama; Kouji Kusabe, Kamakura, and Shuichi Nakatani, Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

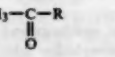
Filed Jan. 16, 1980, Ser. No. 112,710

Claims priority, application Japan, Jan. 30, 1979, 9825

Int. Cl.³ C07C *51/337*

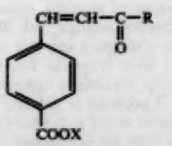
U.S. Cl. 562—493 **6 Claims**

1. A process for producing p-n-alkylbenzoic acid which comprises (1) reacting a p-formylbenzoic acid or its ester with a ketone having the formula



(1)

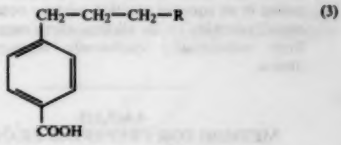
wherein R represents a C_1–C_{18} n-alkyl or n-alkenyl group in the presence of a basic catalyst to obtain an intermediate reaction product, (2) dehydrating said reaction product in an acidic condition to obtain an unsaturated ketone compound having the formula



(2)

wherein R is defined above and X represents hydrogen atom or a C_1–C_6 alkyl group, (3) hydrogenation said unsaturated ketone thereby converting —CH=CH— to —CH_2—CH_2—, and (4) reducing said resulting ketone thereby converting

to —CH_2— to obtain the p-n-alkylbenzoic acid having the formula



(3)

wherein R is C_1–C_{18} n-alkyl.

4,467,113

PROCESS FOR PRODUCING METHACRYLIC ACID

Mutsumi Matsumoto, and Hideki Sugi, both of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha

Filed Nov. 19, 1979, Ser. No. 95,668

Claims priority, application Japan, Dec. 13, 1978, 53-153158

Int. Cl.³ C07C *51/25, 57/055*

U.S. Cl. 562—535 **5 Claims**

1. A process for producing methacrylic acid by oxidizing methacrolein with molecular oxygen or molecular oxygen-containing gas in the vapor phase characterized by the use of a catalyst having heteropoly-acid structure and the general formula:

$$Mo_aV_bP_cCu_dAs_eX_fO_g$$

wherein Mo, V, P, Cu, As and O represent respectively molybdenum, vanadium, phosphorus, copper, arsenic and oxygen, X represents one or more elements selected from the group consisting of tin, lead, cobalt, iron, zirconium, thorium, tungsten, germanium, nickel, rhenium, bismuth, antimony, chromium, boron, magnesium, silver, aluminum, zinc and titanium and a, b, c, d, e, f and g represent the atomic ratio of the elements where,

a is 10,

b is a number of 3 or less than 3 excluding 0,

c is a number of 0.5 to 6,

d is a number of 3 or less than 3 excluding 0,

e is a number of 3 or less than 3 excluding 0,

f is a number of 0 to 3,

g is a number determined depending on the valency and atomic ratio of other elements.

4,467,114

PREPARATION OF TRANS CYCLOHEXANE 1,4-DIUREA

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 215,415, Dec. 11, 1980, Pat. No. 4,418,211, which is a division of Ser. No. 49,112, Jun. 18, 1979, Pat. No. 4,275,223, which is a division of Ser. No. 883,949, Mar. 6, 1978, Pat. No. 4,203,916. This application Sep. 20, 1982, Ser. No. 420,187

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710595

Int. Cl.³ C07C *127/15*

U.S. Cl. 564—57 **1 Claim**

1. A process for making trans-cyclohexane-1,4-diurea preferentially to its cis-stereoisomer, which comprises

(a) reacting mixed cis- and trans-cyclohexane-1,4-dicarboxylic acid or an ester thereof with ammonia in a liquid poly-

hydric alcohol solvent for the acid or ester at a temperature of from about 25° C. to about 200° C. and under an ammonia partial pressure of about 0.1 bar to 50 bars;

(b) separating the resulting solid dicarboxylic acid diamide from the liquid phase including any water soluble constituents therein;

(c) suspending the resulting solid diamide in an aqueous mineral acid or water;

(d) chlorinating the resulting suspended diamide to form cyclohexane-1,4-dicarboxylic acid-bis-N-chloramide, and

(e) reacting said chloramide with a primary or secondary amine in an aqueous reaction mixture containing an alkali metalhydroxide or an alkaline earth metal hydroxide to form substantially exclusively trans-cyclohexane-1,4-diurea.

4,467,115
METHOD FOR PREPARING BRANCHED POLYETHYLENIMINE

David S. Zhuk; Vera A. Keppen, both of Moscow; Nikolai A. Sivov, Schelkovo; Gennady F. Tereschenko, Leningrad; Igor M. Golubkov, Leningrad, and Valery E. Timofeev, Leningrad, all of U.S.S.R., assignors to Institut Neftekhimicheskogo Sinteza Imeni A.V. Toncheva Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Oct. 12, 1982, Ser. No. 433,669
Int. Cl.³ C07C *85/00*
U.S. Cl. 564—512 4 Claims

1. A method for preparing branched polyethylenimine comprising:

(1) isomerizing polymerization of a 2-aryl(alkyl)-2-oxazoline in the presence of protonic acids or complexes thereof with the starting 2-aryl(alkyl)-2-oxazoline with the formation of a poly-N-aroyl(acyl)ethylenimine;

(2) hydrolysis of the resulting poly-N-aroyl(acyl)ethylenimine with the formation of a linear polyethylenimine;

(3) alkylation of the resulting linear polyethylenimine by an alkylation agent comprising β-chlorethylamine or β-aminoethylsulphate at a temperature within the range of from 50° to 200° C. at a molar ratio of the alkylation agent to the linear polyethylenimine of at least 0.5:1 respectively.

4,467,116
PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

Petrus W. N. M. van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 20, 1981, Ser. No. 323,595
Int. Cl.³ C07C *45/50*
U.S. Cl. 568—454 23 Claims

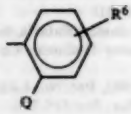
1. A process for the hydroformylation of olefins to aldehydes which comprises reacting at a temperature of from about 50° C. to about 200° C. and a pressure of from about 2 to about 50 bar an olefin containing the group

or the group

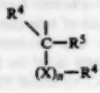
wherein R represents a hydrocarbyl group and the valence bond shown forms part of a hydrocarbyl group, or R together with the valence bond shown represents a ring structure having at least 5 carbon atoms in the ring, with carbon monoxide and hydrogen in the presence of a Group VIII-metal hydroformylation catalyst which has been modified by a ligand according to the general formula

$$L(OR^1)(OR^2)(OR^3)$$

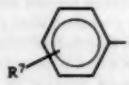
wherein L represents a phosphorus or arsenic moiety and R^1, R^2 and R^3 represent (dis)similar aryl groups provided that at least one of R^1, R^2 and R^3 represents a group



wherein Q represents a group



or a group



wherein each R^4 which may be the same or different represents an optionally fluorine-containing hydrocarbyl group, R^5 represents a hydrogen atom or a group R^4, R^6 represents a hydrogen atom or an inert substituent on the meta and/or para position of the ring, while X represents an oxygen or sulphur atom and n is 0 or 1, and R^7 represents a hydrogen atom or an inert substituent.

4,467,117
PROCESS FOR THE PRODUCTION AND PURIFICATION OF 2,4,4'-TRICHLORO-2'-HYDROXYDIPHENYLETHER

Richard B. Lund, Jackson, and Glenn W. Brown, Wagarville, both of Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,532
Int. Cl.³ C07C *41/26*
U.S. Cl. 568—637 4 Claims

1. A process for the synthesis and purification of 2,4,4'-trichloro-2'-hydroxydiphenylether which comprises the steps of diazotizing 2,4,4'-trichloro-2'-aminodiphenylether; hydrolyzing the resultant diazo compound by addition to H_2SO_4 at a temperature range of about 175°–180° C.; separating the spent acid layer from the upper oily organic layer; distilling said oily organic layer, collecting the fraction distilling at 195°–197° C./4 mm; contacting said fraction with a polychlorinated lower aliphatic hydrocarbon solvent of 3 or less carbon atoms or an aromatic or chlorinated aromatic hydrocarbon solvent; adjusting the solvent-fraction mixture with alkali hydroxide to pH 13 and agitating same; stopping agitation and separating the (top) aqueous product layer from the heavier solvent layer containing the impurities; repeatedly extracting said aqueous product with at least 3 portions of solvent; neutralizing the so-extracted aqueous layer to pH 6–7; separating the resulting (bottom) product layer from the neutralized aqueous layer and then recovering said 2,4,4'-trichloro-2'-hydroxydiphenylether in commercial purity by hydroprilling or crystallization and filtration.

4,467,118

PROCESS FOR THE CATALYTIC SYNTHESIS OF CONJUGATED DIENES FROM DIALKYLALLYLAMINES

Alan J. Chalk, Kinnelon; Steven A. Magennis, Wayne; Vasile S. Wertheimer, and Richard E. Naipawer, Wallington, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

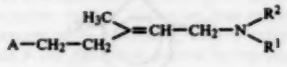
Filed Mar. 3, 1982, Ser. No. 354,322

Int. Cl.³ C07C 1/32, 11/12, 33/02, 41/18, 43/15; C07D 307/06, 309/04

U.S. Cl. 568—687 7 Claims

1. A method for converting an allylic amine to a diene, said amine having at least one allylic hydrogen on a carbon "delta" to the amino nitrogen, which comprises heating said amine in the presence of a zero valent palladium phosphine complex and a weak acid having a pKa in the range 2–6, at a temperature between 100° C. and 150° C.

2. A process according to claim 1, wherein the allylic amine is of the formula



wherein:

represents a dimethylamino, diethylamino, dipropylamino, di-n-butylamino, piperidenyl, morpholinyl, or pyrrolidinyl radical;

the olefinic bond may be E or Z; and,

A represents 2-methylpropenyl, 2-hydroxy-2-methylpropyl, or 2-methoxy-2-methylpropyl.

4,467,119

PHENOLIC ANTIOXIDANT

Royston Thomas, Middlesbrough, England, assignor to ICI Americas Inc., Wilmington, Del.

Filed May 4, 1983, Ser. No. 491,359

Int. Cl.³ C07C 37/84

U.S. Cl. 568—724 7 Claims

1. A process for purifying tris(1-hydroxy-3-methyl-6-tert. butyl phenyl) butane which comprises:

(a) adding an aromatic hydrocarbon having from 6 to 9 carbon atoms to impure product tris(1-hydroxy-3-methyl-6-tert. butyl phenyl) butane and recrystallizing said product from said aromatic hydrocarbon, thereby producing a recrystallized product containing said hydrocarbon;

(b) washing said recrystallized product with a liquid consisting essentially of at least one water-miscible C_1 to C_6 straight or branched chain or cycloaliphatic monohydric alcohol and water, thereby removing at least part of said hydrocarbon; and

(c) recovering purified product tris(1-hydroxy-3-methyl-6-tert. butyl phenyl) butane.

4,467,120

PREPARATION OF α,β-UNSATURATED ALDEHYDES AND 2,7-DIMETHYL-OCTA-2,6-DIENAL

Rolf Fischer, Heidelberg, and Hans-Martin Weitz, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

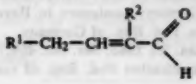
Division of Ser. No. 372,481, Apr. 28, 1982, abandoned. This application Apr. 4, 1983, Ser. No. 481,836

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118656

Int. Cl.³ C07C 45/00, 47/20

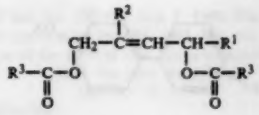
U.S. Cl. 568—484 9 Claims

1. A process for the preparation of an α,β-unsaturated aldehyde of the formula



I

where R^1 and R^2 are aliphatic hydrocarbon radicals of 1 to 15 carbon atoms, which process comprises reacting a 1,4-diacyloxyalk-2-ene of the formula



II

where R^1 and R^2 have the above meanings and R^3 is hydrogen, alkyl, cycloalkyl or aryl, at a temperature of from 0° to 200° C. with water in an amount of 1 to 50 moles per mole of compound II and in the presence of a mineral acid or of a cation exchanger.

4,467,121

FLUORINATED DIPHENOLS AND METHOD FOR THEIR PREPARATION

Victor Mark, Evansville, and Charles V. Hedges, Mount Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 221,884, Dec. 31, 1980, Pat. No. 4,365,098. This application Jul. 26, 1982, Ser. No. 402,165

Int. Cl.³ C07C 39/16

U.S. Cl. 568—726 10 Claims

1. An improved method of making bisphenols having a fluorinated alkyl of 1 to about 22 carbon atoms or fluorinated aryl group of 6 to about 16 carbon atoms and a hydrogen atom upon the methylene carbon atom of the bisphenol comprising mixing at low pressure or up to about 30 lbs/in. sq. a phenol reactant and a fluorinated alkyl of 2 to about 23 carbon atoms or aryl of 7 to about 17 carbon atoms aldehyde compound in the presence of an acid catalyst selected from the group consisting of anhydrous hydrogen chloride and anhydrous hydrogen bromide.

4,467,122

CONDENSATION PROCESS

Otto Szabolcs, Vienna, Austria, assignor to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Continuation-in-part of Ser. No. 250,669, Apr. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 083,609, Oct. 11, 1979, abandoned. This application May 18, 1982, Ser. No. 379,433

Int. Cl.³ C07C 37/20

U.S. Cl. 568—727 16 Claims

1. In a process for the preparation of phenol-aromatic ketone condensation products by reaction of phenols and ketones in

the presence of a gaseous hydrogen halide, the improvement consisting essentially of adding in catalytic amounts up to less than molar amounts based on the ketone as an additional condensation agent at least one soluble bivalent, trivalent or tetravalent metal halide of a metal selected from the group consisting of calcium, iron, titanium, zinc, tin and aluminum, in the presence of the gaseous hydrogen halide and after termination of the condensation reaction, adding water to the reaction mixture and recovering the purified condensation product.

4,467,123

PROCESS FOR THE PREPARATION OF ALKALI METAL DIPHENYLATES AND FREE HYDROXYDIPHENYLS

Dietmar Mayer; Horst-Dieter Kramer, both of Leverkusen; Eike Gabel, Bergisch-Gladbach, and Wilfried Köhler, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,738

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204079

Int. Cl.³ C07C *37/04, 39/12*

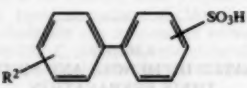
U.S. Cl. 568—730 **22 Claims**

1. In a process for the preparation of a hydroxydiphenyl or an alkali metal diphenylate of the formula

in which

X=hydrogen or an alkali metal

R^1 denotes hydrogen or hydroxyl by contacting a diphenylsulphonic acid of the formula



in which

R^2 denotes hydrogen or the sulphonic acid group, or their alkali metal salts, with an alkali metal hydroxide at elevated temperature and elevated pressure in the presence of water,

the improvement wherein the process is carried out employing 3 to 25 mols of aqueous alkali metal hydroxide having a concentration of at least 50% by weight per equivalent of sulphonate group, at a temperature between 280 and 330° C. and at an elevated pressure of up to 120 bar and, in the case that X denotes hydrogen treating the obtained diphenylate with a mineral acid.

4,467,124

PREPARATION OF 1,1,1,3,3,3-HEXAFLUOROPROPANE-2-OL BY VAPOR PHASE CATALYTIC REACTION OF HEXAFLUOROACETONE HYDRATE WITH HYDROGEN

Toshikazu Kawai, Kamifukuoka, and Akira Negishi, Sayama, both of Japan, assignors to Central Glass Company Limited, Ube, Japan

Continuation of Ser. No. 320,080, Nov. 10, 1981, abandoned. This application May 16, 1983, Ser. No. 493,658

Claims priority, application Japan, Nov. 11, 1980, 55-157665

Int. Cl.³ C07C *31/38*

U.S. Cl. 568—842 **13 Claims**

1. A process of preparing 1,1,1,3,3,3-hexafluoropropane-2-ol, comprising the step of making a hexafluoroacetone hydrate in vapor phase contact with hydrogen gas in the presence of at least one catalyst selected from the group consisting of a nickel catalyst and a palladium catalyst such that said hexafluoroacetone hydrate undergoes hydrogenolysis to 1,1,1,3,3,3-hexafluoropropane-2-ol, wherein said hexafluoroacetone hydrate is expressed by $(CF_3)_2C(OH)_2.xH_2O$, wherein x is $\geqq 0.1$.

4,467,125

NITRO-METHYL OR ETHYL SUBSTITUTED BENZOTRIFLUORIDE

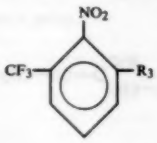
John P. Chupp, Kirkwood, and Gerhard H. Alt, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 10, 1983, Ser. No. 503,375

Int. Cl.³ C07C *79/12*

U.S. Cl. 568—936 **10 Claims**

1. A compound having the formula:



wherein the above formula R is methyl or ethyl.

4,467,126

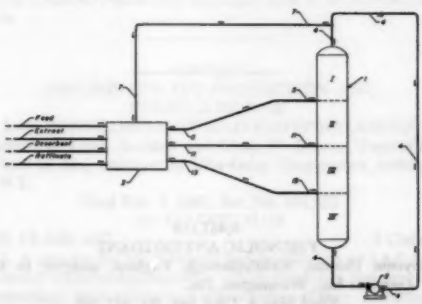
PROCESS FOR THE SEPARATION OF DI-SUBSTITUTED BENZENE

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 18, 1983, Ser. No. 515,001

Int. Cl.³ C07C *79/12, 79/10*

U.S. Cl. 568—937 **10 Claims**



1. A process for separating the para-isomer of a di-substituted benzene, one substituted group being NO_2—and the other substituted group being selected from the group consisting of normal hydrocarbons having less than 6 carbon atoms per molecule, the halogens, NH_2—, NO_2—and C≡N— from a feed mixture comprising said para-isomer and at least one other isomer of said di-substituted benzene, which process comprises contacting at adsorption conditions said mixture with an adsorbent comprising crystalline silica having a silica/alumina mole ratio of at least 12 , selectively adsorbing said para-isomer to the substantial exclusion of the remaining isomers, removing the remaining isomers from said adsorbent and thereafter recovering high-purity paraisomer by desorption with a desorbent material comprising a nitrile or nitro-substituted monocyclic aromatic or alkane in mixture with a monocyclic aromatic carrier material.

4,467,127

PROCESS FOR THE OXYCHLORINATION OF AN ALKANE USING A SOLID SOLUTION CATALYST CONTAINING IRON CATIONS

William J. Kroenke, Brecksville, and Paul P. Nicholas, Broadview Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 950,119, Oct. 10, 1978, Pat. No. 4,375,569, which is a division of Ser. No. 741,510, Nov. 15, 1976, Pat. No. 4,119,570, which is a continuation-in-part of Ser. No. 564,794, Apr. 3, 1975, abandoned. This application Jan. 14, 1983, Ser. No. 457,851

Int. Cl.³ C07C *17/154*

U.S. Cl. 570—224 1 Claim

1. A process for oxychlorination of ethane comprising contacting ethane, oxygen, and hydrogen chloride in the presence of a solid solution catalyst of iron cations in a host lattice of $Ba_{0.50}Ce_{0.17}Ag_{0.33}Al_{12}O_{19}$ at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and hydrogen chloride are employed at a mole ratio of 1 mole of ethane to 0.1 to 10 moles of hydrogen chloride to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.5 percent to 70 percent by weight, expressed as the oxide, and an X-ray diffraction pattern having peak positions different than that of its host lattice.

4,467,128

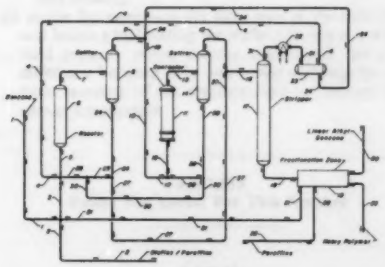
INTEGRATED HF REGENERATION IN AROMATIC HYDROCARBON ALKYLATION PROCESS

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 22, 1983, Ser. No. 534,912

Int. Cl.³ C07C *2/66*

U.S. Cl. 585—456 11 Claims



1. In a process for the production of alkylaromatic hydrocarbons in which a feed aromatic hydrocarbon is brought into contact with an acyclic C_8-plus olefinic hydrocarbon and liquid-phase HF in an alkylation zone at alkylation-promoting conditions to thereby effect the production of the product alkylaromatic hydrocarbon, with a portion of the HF being regenerated by the removal of high boiling hydrocarbonaceous compounds; the improvement which comprises regenerating the HF by passing a stream of the HF into a stripping column in which the hydrocarbonaceous effluent of the alkylation zone is initially fractionated, and recycling high purity regenerated HF recovered from the overhead system of the stripping column to the alkylation zone.

4,467,129

CONVERSION OF XYLENES CONTAINING ETHYLBENZENE

Kazuyoshi Iwayama, Kamakura; Atsushi Ebitani, Kawasaki; Takehisa Inoue, Tokyo, and Atsuo Kani, Zushi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,306

Int. Cl.³ C07C *5/22*

U.S. Cl. 585—481 11 Claims

1. A conversion process for xylenes containing ethylbenzene, characterized in that said xylenes containing ethylbenzene are contacted with a catalyst in the presence of hydrogen, said catalyst comprising an acid type mordenite and an acid type zeolite which exhibits the X-ray diffraction pattern described in Table 1, wherein the weight ratio of said zeolite exhibiting the X-ray diffraction pattern described in Table 1 and said mordenite is in the range of 1% to 50% in terms of a percentage by weight of the former based on the total weight of both said zeolites.

4,467,130

CONDENSATION OF NATURAL GAS OR METHANE INTO GASOLINE-RANGE HYDROCARBONS

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Division of Ser. No. 298,486, Sep. 1, 1981, Pat. No. 4,433,192. This application Jun. 16, 1983, Ser. No. 504,738

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.³ C07C *3/44*

U.S. Cl. 585—709 4 Claims

1. A process for the heterogeneous gas-phase condensation of natural gas or methane into gasoline-range hydrocarbons comprising the steps of:

(a) thermally pretreating the natural gas or methane to form an acetylene-containing mixture;

(b) condensing the resulting methane-acetylene-containing mixture in the presence of a superacid catalyst having a Hammett acidity function H_o less than −11.9 to hydrocarbon mixtures in the gasoline range.

4,467,131

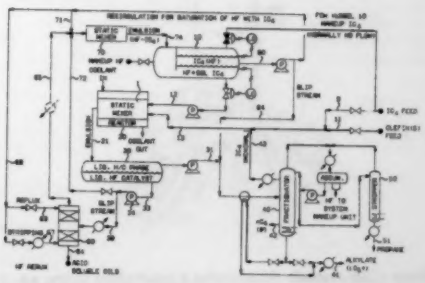
HF ALKYLATION PROCESS AND APPARATUS

Stone P. Washer, and Joe Van Pool, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 12, 1983, Ser. No. 493,841

Int. Cl.³ C07C *2/58*

U.S. Cl. 585—723 11 Claims



1. Process for producing alkylate comprising

(a) contacting in an indirect heat exchanger an HF stream essentially saturated with isobutane and a feed material of isobutane and olefin to produce a mixture of at least two liquid phases, comprising an HF phase and a hydrocarbon phase,

(b) phase separating said mixture into said HF phase and said hydrocarbon phase containing said alkylate,

(c) resaturating at least a substantial portion of said HF phase with isobutane in a separate resaturation zone, comprising a mixer followed by a settler, wherein said HF phase is introduced together with excess isobutane into said mixer to form a resaturation emulsion, wherein said resaturation emulsion is introduced from said mixer into said settler, wherein said liquid HF phase saturated with isobutane is removed as the lower liquid phase from said settler and wherein an isobutane stream is removed as an upper liquid phase from said settler and this isobutane stream is recycled to said mixer, and

(d) introducing at least a portion of the so obtained liquid HF phase saturated with isobutane to said contacting step (a) as said HF stream.

4,467,132

AKLYLATION AID FOR SULFURIC ACID CATALYZED ALKYLATION UNITS

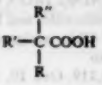
Ting S. L. Go, Houston, and George R. Wilson, III, San Antonio, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 3, 1983, Ser. No. 463,433

Int. Cl.³ C07C 2/58

U.S. Cl. 585—724 16 Claims

1. In an alkylation process comprising contacting an alkylatable hydrocarbon with an olefinic alkylating agent at alkylation conditions in the presence of an acid catalyst and an alkylation promoter, the improvement comprising using as the promoter at least one carboxylic acid having the structure



wherein R, R' and R" are the same or different alkyl groups and the average total sum of carbon atoms in R, R' and R" is 3 to 20.

4,467,133

CONVERSION OF ALCOHOLS AND ETHERS TO DISTILLATE RANGE HYDROCARBONS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,087

Int. Cl.³ C07C 1/00

U.S. Cl. 585—733 4 Claims

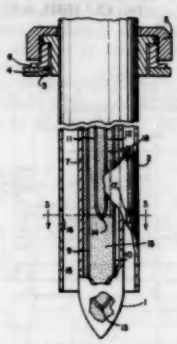
1. A process for the selective conversion of alcohols or ethers or mixtures thereof to distillate range hydrocarbons said process comprising contacting a feed selected from the group consisting of alcohol, ether and mixtures thereof with a large pore crystalline aluminosilicate zeolite catalyst selected from the group consisting of synthetic faujasite, zeolite X and Zeolite Y at a pressure in the range of from about 5 to about 200 atmospheres and at a conversion temperature below about 600° F.

4,467,134

THERMOCOUPLE WITH OUT-OF-LINE ASPIRATION HOLES

Robert A. Pustell, Andover, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 30, 1983, Ser. No. 510,095
Int. Cl.³ H01L *35/02*
U.S. Cl. 136—231 15 Claims



1. A thermocouple assembly for measuring the temperature of a fluid stream comprising:

(a) a casing,

(b) at least one pair of dissimilar wires disposed in said casing and forming a thermocouple junction,

(c) insulation dispersed in said casing and separating said dissimilar wires from said casing and from each other,

(d) a protective housing spaced apart from and surrounding at least a portion of said casing containing a thermocouple junction,

(e) means to allow a part of the heated stream to flow through said protective housing and past said casing in the area of the thermocouple junction, including:

(1) an inlet opening in said housing positioned essentially along the flow axis of the stream,

(2) at least one outlet opening in said housing downstream from the inlet opening to establish a flow path through said housing,

(f) means for increasing the flow rate of the fluid through said housing by locating the outlet opening at a minimum fluid pressure point, thereby maximizing the pressure difference between inlet and outlet openings to provide rapid response of the thermocouple to changes in fluid stream temperature.

4,467,135

Patent Not Issued For This Number

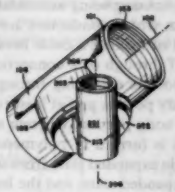
4,467,136

DRAINABLE ENCLOSURE FOR EXPLOSION-PROOF ELECTRICAL SYSTEMS

Eigil Wium, Cheshire, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 25, 1981, Ser. No. 324,923
Int. Cl.³ H02G *3/04*
U.S. Cl. 174—50 8 Claims

1. A fitting for explosion-proofing electrical conduits which comprises a main body having a passage therethrough for wires between an entry port and an exit port at opposite ends of said main body, said entry and exit ports providing connections to said conduits, said passage having a generally circular cross section of a first diameter, said main body having a service port through the side thereof of a second diameter larger than said first diameter, an auxiliary body member having a coupling port rotatably attachable to said service port, said coupling port having a passage therethrough, said auxiliary body member also having a fill port and a drain port with passages therethrough which are in alignment with each other and which intersect the passage through said coupling port, said auxiliary body member also having a barrier dam connecting to said drain port and extending in a first direction toward said fill port partially across said coupling port passage, said barrier dam also extending across said coupling port passage in a second direction transverse to said first direction partially closing said coupling port passage, said barrier dam having a lip disposed between the fill port passage and the drain port



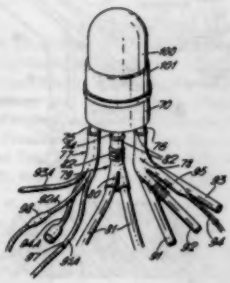
passage and also extending in said second direction across said coupling port passage, the distance across said coupling port passage in said first direction closed by said barrier dam and said auxiliary body member to the lip of said barrier dam being longer than said first diameter to define a sealing chamber with the surfaces of the passage in said main body between said entry and exit ports, and a body of dam material across said main body passage at the exit port end thereof said sealing chamber being entirely fillable with sealing compound introduced through said fill port regardless of the angular orientation of said main body and the passage there through with respect to the vertical.

4,467,137

CABLE BREAKOUT ARTICLE

Jonathan Paget, Swindon, and David H. Thomas, Inkpen, both of England, assignors to Raychem Limited, London, England

Filed Jun. 21, 1982, Ser. No. 390,715
Claim priority, application United Kingdom, Jun. 22, 1981, 8119242; Oct. 14, 1981, 8131053
Int. Cl.³ H02G *13/06;* H01R *4/00;* B29C *27/00;* H01B *13/06*
U.S. Cl. 174—87 35 Claims



1. An article comprising a substantially dimensionally stable planar or hollow body portion, the body portion if hollow having two substantially cylindrical parts assemblable to form the body portion, wherein the body portion has at least two outlet holes and at least two outlet tubes respectively attached to the outlet holes, and the length and flexibility of the outlet tubes is such that at least one of the outlet tubes can be bent away from the other outlet tube(s) to an extent permitting operations to be carried out at least on an end portion of a

selected one of the outlet tubes substantially in isolation from the other outlet tube(s).

25. A kit of parts for making a cable breakout comprising a substantially dimensionally stable housing capable of receiving a portion of a cable, the housing comprising two substantially cylindrical parts one of which parts has at least two outlet holes through which conductors may be led off from the cable and has attached at least to each of the said two outlet holes respectively outlet tubes of such length and flexibility that at least one of the outlet tubes can be bent away from the other outlet tube(s) to an extent permitting operations to be carried out at least on an end portion of a selected one of the outlet tubes substantially in isolation from the other outlet tube(s), the two parts of the housing being assemblable to enclose the part of the cable from which conductors are led off in use.

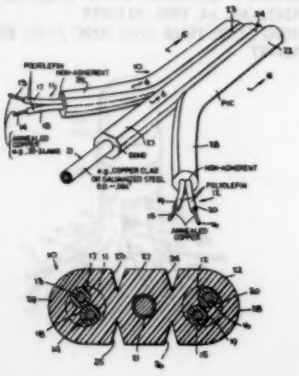
34. A method of making a cable breakout wherein a cable portion is led off through or a connection is made to the free end of a cable portion extending through a tube of an article comprising a body portion and at least two tubes leading from apertures in the body portion, wherein at least part of at least one of the tubes is formed of polymeric material and is in a temporarily stable expanded state from which it is recoverable towards an unexpanded state, and the length and flexibility of the tubes is such that at least the said one of the tubes can be bent away from the other tube(s) to an extent permitting operations to effect recovery of an expanded part of a selected one of the tubes to be carried out substantially in isolation from the other tube(s) whereby that tube is isolated from the other tube of the said article by bending the one or the other to an extent permitting operations to be carried out at least on an end portion of that tube substantially in isolation from the other tube(s) and operations are thereafter carried out on a portion of that tube substantially in isolation from the other tube(s) to seal the tube around the relevant cable portion and/or the said connection.

4,467,138

PLURAL CONDUCTOR COMMUNICATION WIRE

William J. Brorein, Whippany, N.J., assignor to GK Technologies, Inc., Greenwich, Conn.

Filed Jan. 17, 1983, Ser. No. 458,300
Int. Cl.³ H01B *11/02, 7/08*
U.S. Cl. 174—115 **15 Claims**



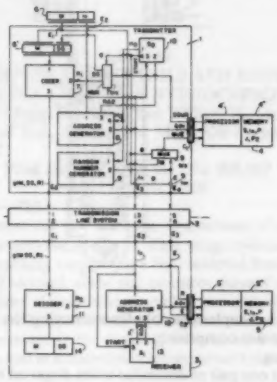
1. A communication wire of generally flat construction especially adapted for telephone drop wire service, the wire being separable along longitudinal weakening lines into a central and two side portions, the central portion containing a length of steel wire surrounded by and adherently embedded in a body of PVC material, each of said side portions containing, non-adherently embedded in a continuation of said body of PVC material, at least one polyolefin covered communication conductor.

4,467,139

PROCESS AND SYSTEM FOR TRANSMISSION OF SIGNED MESSAGES

Jean H. Mollier, Bougival, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Filed Mar. 12, 1981, Ser. No. 242,850
Claims priority, application France, Apr. 9, 1980, 80 07912
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.08 **49 Claims**



1. A process for the transmission of signed messages M between a transmitter and a receiver connected via a transmission line system, the transmitter including a coding device and the receiver including a decoding device, said process comprising:

calculating a signature SG at the transmitter location as a function of the message M which is to be transmitted and as a function of a secret code J which enables the subsequent certification of the signature;

linking the message with the signature thus obtained;

generating at the transmitter location a common key E;

calculating at the transmitter location as a function of at least the common key E an intrinsic coding key R_1 and employing the intrinsic coding key R_1 to encode the linked message and signature;

causing the transmitter to transmit the common key E and the encoded message and signature; and

calculating at the receiver location as a function of at least the common key E an intrinsic decoding key R_2 and employing the intrinsic decoding key R_2 to decode the coded message and signature.

4,467,140

MICROPROCESSOR-BASED CORDLESS TELEPHONE SYSTEM

George H. Fathauer, and Warren L. Williamson, both of Mesa, Ariz., assignors to Masco Corporation of Indiana, Cumberland, Ind.

Filed May 1, 1981, Ser. No. 259,787
Int. Cl.³ H04Q *7/04*
U.S. Cl. 179—2 EA **74 Claims**

53. A cordless telephone comprising a base unit operatively coupled to a user's telephone lines and a portable cordless handset, each of said base unit and said cordless handset including a transceiver having a transmitter, a receiver and a single antenna for forming a full duplex radio link for two-way communication between said base unit and said cordless handset, the transmitter of said base unit and the receiver of said cordless handset operating on a first non-CB frequency and the transmitter of said cordless handset and the receiver of said base unit operating on a second different and distinct non-CB

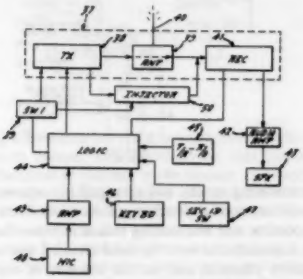
frequency, each of said transceivers further including means for selecting one of a receive-only mode of operation and a transmit-receive mode of operation, said cordless telephone further comprising:

means responsive to the selection of said receive-only mode of operation for supplying a relatively small quantity of energy to said transmitter for generating only a relatively weak transmitter frequency signal;

signal injection means for directly injecting said relatively weak transmitter frequency signal into the input of a corresponding receiver to serve as the local oscillator frequency thereof;

means responsive to the selection of said transmit-receive mode of operation for supplying a relatively large quantity of energy to said transmitter for generating a relatively strong transmitter frequency signal for driving said antenna while simultaneously disabling said direct signal injection means; and

means for operatively coupling the single antenna of each of said transceivers to a corresponding transmitter output and to a corresponding receiver input such that when said transceiver is in said transmit-receive mode of operation, at least a portion of said relatively strong transmitter frequency signal is supplied from the transmitter output to a corresponding receiver input for providing the local oscillator function thereof, thereby enabling at least some portion of said transmitter signal to be supplied to the input of a corresponding receiver for providing the local oscillator frequency thereof regardless of whether said transceiver is operating in said receive-only mode of operation or in said transmit-receive mode of operation.



4,467,141

TELECOMMUNICATION SYSTEM WITH RADIO LINE

Heinz Resch, Vienna; Franz Machl, Perchtoldsdorf; Klaus Kerschbaumer, Vienna, and Helmut Ullrich, Ebenfurth, all of Austria, assignors to Portaphone AG, Pfäffikon, Switzerland

Filed Sep. 7, 1982, Ser. No. 415,445

Claims priority, application Austria, Sep. 8, 1981, 3879/81

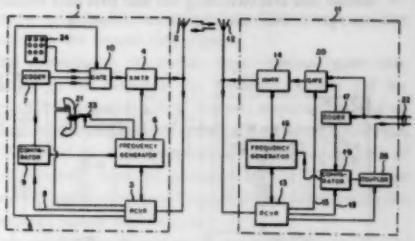
Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 EA **4 Claims**

1. A telecommunication system comprising a wired network and a multiplicity of posts served by said network for selectively communicating with one another, each of said posts being uniquely identified by an individual call number and comprising a relay station connected to a branch of said network and a mobile subscriber station coupled with said relay station by a radio link of limited range;

said subscriber station comprising a first radio transmitter and a first radio receiver tunable to any one of a plurality of communication channels available to a group of said posts, said first radio receiver being provided with first scanning means for cyclically exploring said channels in an idle state of the subscriber station to determine their free or busy condition, said subscriber station further comprising first coding means and first comparison means connected to said first radio receiver and to said first coding means for detecting an identity between a locally generated reference code and a code received on one of said channels and for causing said first radio transmitter to send out a first verification signal on the same channel upon detection of such identity, said subscriber station additionally including selector means for initiating an outgoing call by triggering said first radio transmitter to send out a locally generated identification code on a channel found idle by said first radio receiver preparatorily to the emission of a call signal to said network in response to reception of a second verification signal on the channel found idle,

said relay station comprising a second radio transmitter and a second radio receiver tunable to said channels, said second radio receiver being provided with second scanning means for cyclically exploring said channels in an idle state of the relay station to determine their free or busy condition, said relay station further comprising second coding means and second comparison means connected to said second radio receiver and to said second coding means for detecting an identity between a locally generated reference code and a code received on one of said channels and for causing said second radio transmitter to send out said second verification signal upon detection of such identity, said second radio transmitter being triggerable by an incoming call signal from said network to send out a locally generated identification code on a channel found idle by said second radio receiver preparatorily to seizing the idle channel in response to reception of said first verification signal thereover for enabling an extension of the incoming call to said subscriber station.



4,467,142

SYSTEM FOR TRANSMITTING EMERGENCY CALLS FROM PERSONS REQUIRING ASSISTANCE

Dieter Rupp, Allmersbach; Wolfgang Weeber, Aspach; Paul Lissner, Backnang, and Josef Steimle, Allmersbach, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,369

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137147

Int. Cl.³ H04M *11/04*

U.S. Cl. 179—5 R **3 Claims**

1. A system for transmitting an emergency call from a person requiring assistance, said system comprising an emergency calling device coupled via at least one subscriber line of a telephone exchange system to an emergency call receiving center having an operator,

said emergency calling device including:

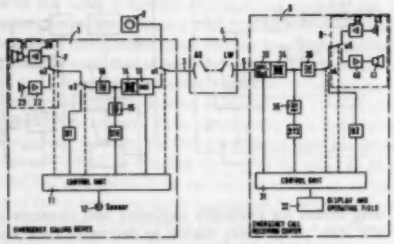
automatic dialing means coupled to one such subscriber line and having an actuating sensor, said automatic dialing means automatically dialing a predetermined emergency telephone number upon actuation of said sensor by the person requiring assistance for placing a telephone call via the telephone exchange system to said emergency call receiving center;

first data means selectively connectable to the subscriber line for transmitting predetermined emergency data by frequency keying in the voice band via the telephone exchange system to said emergency call receiving center;

intercommunication means selectively connectable to the subscriber line for establishing a voice connection via the telephone exchange system between the person requiring assistance and the operator in said emergency call receiving center, said intercommunication means including first controllable switching means for switching between states of voice transmission and voice reception; and

first control means responsive to a first operating mode control signal transmitted via the telephone exchange system for connecting said first data means to the subscriber line and switching out said intercommunication means, and responsive to a second operating mode control signal transmitted via the telephone exchange system for connecting said intercommunication means to the subscriber line and switching out said first data means; and

said emergency call receiving center including:



means coupled to the telephone exchange system for receiving the call from said emergency calling device and establishing a connection via the telephone exchange system between said emergency calling device and said emergency call receiving center;

means for producing a control tone selectively connectable to the telephone exchange system;

second control means for controlling the transmission of said control tone via the telephone exchange system to said emergency calling device, said control tone constituting said first operating mode control signal, and the lack of said control tone constituting said second operating mode control signal; and

second data means selectively coupled to the telephone exchange system for selectively transmitting voice direction control signals by frequency keying in the voice band via the telephone exchange system to said emergency calling device for controlling the state of said switching means in said intercommunication means of said emergency calling device.

4,467,143

TELEPHONE CONFERENCE AMPLIFIERS, AND TELEPHONE CONFERENCE BRIDGES INCORPORATING THE SAME

Bloomfield J. Warman, 67, King Harold's Way, Bexleyheath, Kent, England

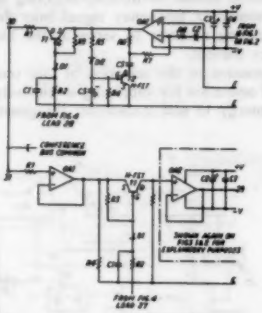
Filed Sep. 29, 1982, Ser. No. 426,596

Claims priority, application United Kingdom, Oct. 22, 1981, 8131927

Int. Cl.³ H04M *3/56*

U.S. Cl. 179—18 BC **3 Claims**

1. A telephone conference port amplifier comprising send and receive speech path channels respectively connected between a common port intended for connection in common with like ports of other conference port amplifiers to a conference bus and a conference port providing coupling to a telephone line, said send channel serving for the transmission of speech signals in a direction from said common port towards the conference port and said receive channel serving for the transmission of signals in a direction from the conference port towards the common port, wherein each said speech path channel includes an amplifying means and an associated, controllable attenuating means, and said amplifier further comprises control means, having an input connected to said conference port, having outputs connected to said respective control-



lable attenuating means, and arranged in response to the detection at said input of a speech signal received from the telephone line to control said attenuating means in senses such that attenuation is introduced into the send channel and removed from the receive channel, and in the absence of such a detected signal to control said attenuating means in senses such that attenuation is introduced into the receive channel and removed from the send channel.

4,467,144

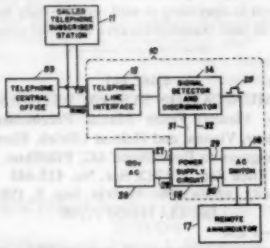
TELEPHONE ANNUCIATOR EXTENDER

Timothy M. Wilkerson, Princeton, and Edward B. Learned, Evansville, both of Ind., assignors to AMF Incorporated, White Plains, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,460

Int. Cl.³ H04M *1/26*

U.S. Cl. 179—84 R **10 Claims**



1. Apparatus for controlling a device in response to voltage varying portions of a single ringing signal on a telephone line, said apparatus comprising:

first means connected to said telephone line for producing first signals in response to voltage variations on said telephone line in excess of a predetermined voltage time-rate-of-change;

second means coupled to said first means, for providing a control signal only in response to a series of first signals having no more than a predetermined time between each of the successive first signals; and

third means for controlling a device in response to the control signal provided by said second means.

4,467,145
HEARING AID

Heinz-Dieter Borstel, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

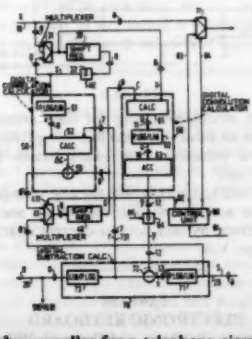
Filed Feb. 11, 1982, Ser. No. 347,929
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3109049
Int. Cl.³ H01R 25/00
U.S. Cl. 179—107 R 4 Claims

1. A hearing aid system having a hearing aid electric circuit including switch means, characterized in that an element changing its electrical properties in the manner of a switch due to the influence of a magnetic field is employed in the switch means of the electrical circuit; and in that magnetic field producing means functions as the actuator for the switch means, with said magnetic field producing means comprising a permanent magnet, and means mounting said permanent magnet for manual actuation between a first position with said element out of the effective field range of said permanent magnet, and a second position with the magnetic field of said permanent magnet actuating said element so as to change its electrical properties and produce a different switching state.

4,467,146
ECHO CANCELLER UTILIZING PSEUDO-LOGARITHMIC ENCODING LAW

Jean Lassaux, Orvault, France, assignor to Telecommunication Radioelectriques et Telephoniques, Paris, France

Filed Dec. 16, 1981, Ser. No. 331,483
Claims priority, application France, Dec. 17, 1980, 80 26808
Int. Cl.³ H04B 3/20
U.S. Cl. 179—170.2 8 Claims



1. In an echo canceller for a telephone circuit having two digital paths for PCM signals obtained in accordance with a pseudo-logarithmic encoding law, which echo canceller is arranged in said telephone circuit in the proximity of a line interface unit for at least one subscriber and has for its object to cancel in one digital path for conveying pseudo-logarithmic code words S of a near-end speech signal supplied by said interface unit, denoted send path hereinafter, the echo effect of pseudo-logarithmic code words X of a far-end speech signal conveyed to said interface unit via the other digital path, denoted receive path hereinafter, the echo canceller comprising:

a first circulating shift register having an input, an output and a capacity of (k+1) code words, the input being connected to the receive path for receiving a pseudo-logarithmic code word X at each instant nT (where T is the sampling period of the code words and n is an integer for characterizing the number of the relevant instant) and the circulation rate of the code words in this first shift register being such that the sequence of the k most recent code words X occurs in the time interval between two consecutive instants nT and (n+1) T;

a second circulating shift register having an input, an output and a capacity of k code words, this second shift register operating in phase with the first shift register and a sequence of k coefficient code words C circulating permanently in this second shift register;

digital convolution calculation means having inputs connected to the output of the first shift register and the output of the second shift register, respectively, and an output supplying at each instant nT an echo cancellation code word obtained by summing k code words, each of which results from an operation for combining a code word C and a code word X supplied simultaneously by the first and second shift registers;

digital subtraction calculation means having an input connected to said interface unit, means for converting pseudo-logarithmic code words to linear code word, a correction input connected to the output of the convolution calculation means and an output connected to the send path, a sequence of pseudo-logarithmic code words R being supplied to the send path, each of which results from an operation for combining a code word S supplied by said interface unit and an echo cancellation code word supplied by the convolution calculation means;

digital correlation calculation means having inputs connected to the output of the first shift register, the subtraction calculation means and the output of the second shift register, respectively, and an output connected to the input of the second shift register for modifying the value of the code words C circulating therein as a function of comparison criteria for the code words supplied by the first shift register and the subtraction calculation means, respectively; the improvement wherein the convolution calculation means comprises:

a calculator unit having inputs connected to the output of the first shift register and the output of the second shift register, respectively, and an output, said calculator unit supplying a sequence of pseudo-logarithmic code words U, each of which results from an operation for combining a code word X and a code word C,

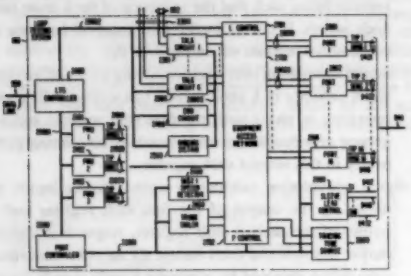
a first pseudo-logarithmic-to-linear code converter having an input connected to the output of said calculator unit, and an output, this code converter converting each pseudo-logarithmic code word U into a linear code word u; and

an accumulator-adder having an input connected to the output of said first code converter, and an output connected to the correction input of the subtraction calculation means, this accumulator-adder producing at each instant nT a linear echo cancellation code word $\bar{y}$ which is the sum of the k most recent linear code words u.

4,467,147
SWITCHING NETWORK FOR INTERACTIVE ACCESS AND TESTING OF SUBSCRIBER LOOPS

Harvey Rubin, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,188
Int. Cl.³ H04M *3/24*
U.S. Cl. 179—175.2 C **8 Claims**
MICROFICHE APPENDIX INCLUDED
(25 Microfiche, 1537 Pages)



1. A switching network (2700) for interconnecting subscriber line trunk circuits (e.g., 2801) with test circuits (e.g., 2301) operated by loop controller means (2000) and with access circuits (e.g., 2650) operated by port controller means (2200), said switching network comprising

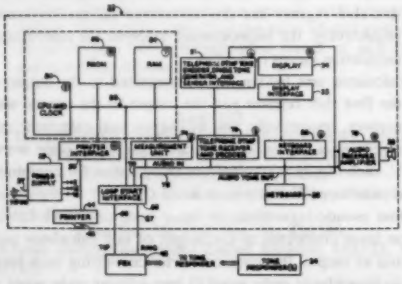
first means (2702 and e.g., 2710 and P1), responsive to said port controller means, for selectively connecting each of said trunk circuits with each of said access circuits, and

second means (2701 and e.g., 2710 and L3), responsive to said loop controller means and operated independently of said first means, for selectively connecting said each of said trunk circuits with each of said test circuits.

4,467,148
TELEPHONE LINE ANALYZER

James A. Stafford, Danbury, Conn.; Richard W. Neiss, Nashua, N.H., and Daniel S. Coolidge, Sandy Hook, Conn., assignors to Network Control Corporation, Danbury, Conn.

Filed Feb. 2, 1982, Ser. No. 345,142
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—175.3 R **25 Claims**



1. A telephone line analyzer for use with telephone lines having a telephone line selectable private branch exchange (PBX) connected to the lines at one end, comprising:

(A) a local unit having

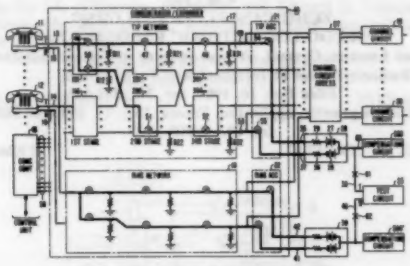
1. means for interfacing with the telephone line selectable PBX and for instructing the PBX to select one of the interconnected telephone lines,
2. means for encoding and sending a dual tone multiple frequency (DTMF) signal on the selected telephone line,
3. means for decoding a received DTMF signal on the selected telephone line,
4. means for measuring the voltage of a received signal on the selected telephone line,
5. means for printing the value of a received signal as determined by the measurement means,
6. central processing means for controlling the interaction of the interfacing means, the DTMF encoder, the DTMF decoder, the measurement means and the printer means so that any of the plurality of telephone lines connected to the PBX can be tested at desired times,
7. means for entering telephone line test programs for desired telephone lines to be tested, the test programs including the desired times for selected lines to be tested and the type of test to be executed, and
8. means for interconnecting the PBX interface means, the DTMF encoder means, the DTMF decoder means, the measurement means, the printer means, the control means, and the test program entering means; and

(B) a tone responder, communicable with the telephone line at its second end, the tone responder comprising means for encoding and sending a DTMF signal to the selected telephone line at the telephone line's second end upon selection of this line by the PBX.

4,467,149
COMPENSATION METHOD AND APPARATUS FOR USE WITH NONIDEAL TEST ACCESS LINES

Laurence L. Sheets, St. Charles, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 10, 1983, Ser. No. 465,534
Int. Cl.³ H04M *3/22*
U.S. Cl. 179—175.23 **14 Claims**



1. A method of compensating for the variation of a test access line from an ideal insulated line comprising

determining a voltage-current characteristic for said test access line and

supplying to said test access line, for any voltage, V, applied to said test access line, the magnitude and polarity of current defined by said voltage-current characteristic for that voltage, V.

4,467,150
ELECTRONIC KEYBOARD

Richard Leitermann, Brighton, and Bruce G. Wilson, Sudbury, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 24, 1982, Ser. No. 351,719
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—5 A **16 Claims**

1. An electronic keyboard comprising:

A. a base,

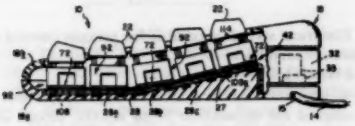
B. a flexible printed circuit positioned on the base, said

circuit defining a plurality of spaced-apart electric switches arranged in one or more rows on the base, each switch remaining open until the printed circuit is depressed at the location of that switch,

C. one or more similar spring strips positioned against the printed circuit, each said strip extending opposite a plurality of switches in each switch row on the base defined by the printed circuit, each spring strip comprising a lengthwise series of spring members each of which actuates an underlying switch in the underlying switch row when moved from a relaxed position to a stressed position and each spring strip in each row being separate from the spring strips extending along adjacent rows on the base,

D. one or more similar key guide strips positioned opposite each row of spring strips, each key guide strip defining a lengthwise series of key guides for movably mounting keys opposite underlying spring members,

E. means for mounting each key guide strip separately to the base so as to fix the positions relative to the base of the key guide strips and the spring strips and printed circuit portions in each row on the base, and



F. similar keys movably mounted in the key guide strips so as to engage underlying spring members, each said key being supported in a first position by the engaged spring member when that member is in its relaxed position, said key being movable to a second position so as to move the engaged spring member to its said stressed position, said spring strips, key guide strips and keys being interchangeably positionable on and mountable to any of the switch rows on said base.

14. An electric keyboard of the type having a base, a flexible circuit defining a plurality of switches and a plurality of key means for actuating the switches,

A. said base comprising a surface having a plurality of faces at least one of which is oriented in a different plane from but intersecting another of said faces, and

B. wherein

(1) the flexible circuit is disposed on said surface and extends over all of said faces, and

(2) said a plurality of key means is disposed on the flexible circuit and extends over all of said faces.

4,467,151

PLANAR TOUCH PANEL

Robert J. Johnson, Inver Grove Hgts.; Charles N. Miller, Apple Valley, and G. Patrick Bonnie, Minneapolis, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Dec. 13, 1982, Ser. No. 449,048
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **10 Claims**

1. A planar electrical switch, including:

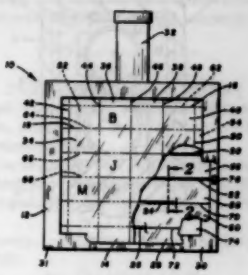
a flat, flexible and electrically insulative membrane;

a flat and electrically insulative substrate layer;

a plurality of substantially straight and parallel first electrically conductive paths integral with said membrane and separated from one another by first insulative boundaries parallel with said first paths;

a plurality of substantially straight and parallel second conductive paths integral with said substrate layer and separated from one another by second insulative boundaries parallel with said second paths;

mounting means at the periphery of said substrate layer for supporting said membrane and substrate layer proximate one another with said first and second conductive paths facing each other and normally spaced apart from each other, and further for aligning said membrane and said substrate layer whereby elastic deformation of said membrane at a selected location thereon and toward the substrate layer moves a selected one of said first paths into electrical contact with a selected second path; and



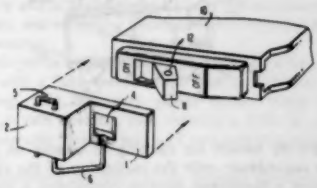
dielectric spacing means spanning the distance across said substrate layer, positioned between said membrane and substrate layer, and fastened at each end thereof with respect to the substrate periphery for confining and guiding the deformation of said membrane proximate said selected location, said spacing means having a generally convex surface facing the membrane.

4,467,152

CIRCUIT BREAKER LOCK OUT ASSEMBLY

Wade T. Gordy, Jackson, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 18, 1983, Ser. No. 495,889
Int. Cl.³ H01H *9/28*
U.S. Cl. 200—42 T **18 Claims**



1. A lock out assembly comprising: a generally step-shaped unitary base with an aperture in a small portion of the step-shaped base; and a roughly "S" shaped retaining pin which loops through a large portion of the step-shaped base whereby the lock out assembly is adapted to fit on a circuit breaker with a switch handle projecting through the aperture, and the retaining pin projecting into an opening of the switch handle, preventing removal.

4,467,153

SHOCK AND VIBRATION SENSITIVE SWITCH

Arnold H. Jones, and Donald L. Grissom, both of Blacksburg, Va., assignors to Litton Systems, Inc., Blacksburg, Va.

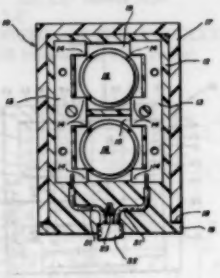
Filed Feb. 7, 1983, Ser. No. 464,344
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—61.45 R **3 Claims**

1. A shock and vibration sensitive switch for detecting the presence of a intruder comprising:

a frame member surrounding an open cavity,

two E shaped electrodes mounted in said frame member on opposite sides of said cavity and a plurality of contact points presented by said electrodes and protruding into said cavity,

two inertia weights each supported by two contact points



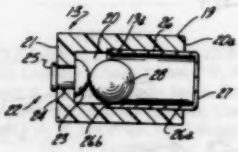
such that each of said inertia weights completes an electrical circuit from one of said E shaped contacts to the other, whereby said inertia weights are in an electrical parallel arrangement, and whereby said inertia weights provide redundant current paths allowing proper switch operation in the event of failure of one of said current paths.

4,467,154

GRAVITY SWITCH AND METHOD OF MAKING SAME

Clinton W. Hill, Romeo, Mich., assignor to U. S. Plastics Corporation, Mt. Clemens, Mich.

Filed May 4, 1983, Ser. No. 491,492
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—61.45 R **13 Claims**



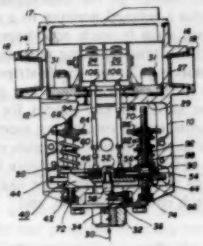
1. A gravity switch for opening or closing an electrical circuit in accordance with the inclination of the axis of the switch from a horizontal position comprising a cup-shaped dielectric member having axially extending sidewalls forming an enclosure, a base closing one axial end of said enclosure, and a mouth opening axially endwise at the opposite axial end of said enclosure; first contact means of electrical conducting material comprising an interior electrical contact within said enclosure adjacent to said base, an exterior electrical contact externally of said enclosure, and means extending through said member and electrically connecting said interior and exterior contacts; second contact means of electrical conducting material spaced from the first contact means and fixed with respect to said enclosure, said second contact means having guide portions extending axially along said sidewalls in the direction from said base toward said mouth and effecting an interference fit with said sidewalls, said guide portions terminating in said direction in portions closing said mouth and defining a second exterior contact; and means for selectively completing an electrical connection between said guide portions and said interior contact comprising gravity actuated contact means movable axially along said guide portions in electrical contact therewith to and from positions of electrical contact with said interior contact in accordance with the inclination of said axis.

4,467,155

ELECTRICAL SWITCH APPARATUS

Christopher P. Grudzien, Jr., Prospect, and Leonard P. DelVecchio, Jr., Trumbull, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 6, 1982, Ser. No. 375,618
Int. Cl.³ H01H *35/24*
U.S. Cl. 200—81 R **10 Claims**



1. Electrical switch apparatus for process control comprising in combination:

a. a housing;

b. at least one electrical switch supported in said housing adapted for connection to an electric circuit associated with a process to be controlled for energizing and deenergizing the circuit at predetermined values of a process variable;

c. double beam means in said housing and displaceable for actuating said at least one electrical switch between the make and break positions of the switch contacts;

d. an inlet in said housing to receive an input force corresponding to ongoing values of the process variable;

e. force applicator means supported in said housing between said inlet and said double beam means for imposing the received input force against said double beam means to urge displacement thereof toward actuating said at least one electrical switch;

f. biasing means operative to apply a force against said double beam means opposing displacement of said double beam means by said force applicator means; and

g. adjustment means for presettably adjusting the opposing force of said biasing means to preset set point operation of said at least one electrical switch by said double beam means.

4,467,156

LIQUID LEVEL SENSOR SWITCH

Edwin A. Dvorak, Redford; George Nagy, Jr., Canton; Boris Pascasu, Dearborn Heights, and Gary A. Pniewski, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 10, 1983, Ser. No. 456,928
Int. Cl.³ H01H *35/18*
U.S. Cl. 200—84 R **10 Claims**

1. A self-orienting liquid level sensor switch comprising:

means defining an electrically conducting housing;

means for attaching said housing to a substantially vertical wall of a liquid holding container;

means mounted within said housing defining an electrically isolated terminal;

means defining a generally cylindrical float element ballasted along its length;

apertured retaining means attached to said housing for surrounding and said blast element to limit the maximum movements of said float element; and

electrically conductive means mounted on said float means to provide an electrical path between said terminal means and said retaining means attached to said housing when said liquid level is below a predetermined level.

4,467,157

PRESSURIZED GAS CIRCUIT BREAKER INCLUDING TWO V-MOUNTED BREAKER CHAMBERS PER PHASE

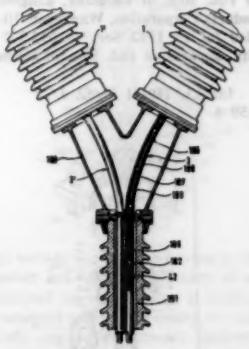
Dante Nicoloso, and Doan Pham Van, both of Meyzieu, France, assignors to Alsthom-Atlantique, Paris, France

Filed Oct. 8, 1982, Ser. No. 433,493

Claims priority, application France, Oct. 12, 1981, 81 19157; May 17, 1982, 82 08548

Int. Cl.³ H01H 33/42

U.S. Cl. 200—148 F 7 Claims



1. A pressurized gas circuit breaker comprising: a vertical insulating support; an intermediate structure mounted on said support and having at least two breaker chambers per phase, said chambers being disposed in a V-configuration on said intermediate structure, said support and said breaker chambers being filled with gas under pressure; said circuit breaker further comprising a control jack situated at the bottom of the support, and means for transmitting motion from the jack to the chambers to operate circuit breaking means located therein; the improvement wherein; said means for transmitting motion comprise: gas-tight guide tube means filled, in use, with gas under pressure and having a straight insulating portion situated inside the vertical insulating support and curved portions situated inside said intermediate structure and leading to respective ones of said breaker chambers; and control shaft means mounted with a sliding fit inside said guide tube means, said control shaft means having one end connected to said control jack, and other ends connected to respective ones of said breaker chambers, the portions of said control shaft means that slide in the curved guide tube portions being flexible; and wherein each breaker chamber is fitted with a respective sliding air-lock for sealing at one end the breaker chamber and at another end the guide tube means, said air-lock comprising two separable members one of which is made fast to the breaker chamber and the other of which is made fast to the guide tube means, and said control shaft means comprising coupling means located inside said air-lock to enable the control shaft means to be separated into a first portion connected to the breaker chamber and a second portion connected to the guide tube means.

4,467,158

PUFFER TYPE GAS CIRCUIT

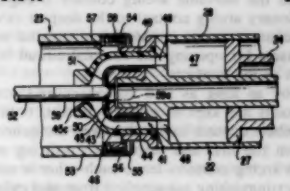
Akio Kobayashi; Yasuo Ozaki, and Sunao Rikitake, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 349,158, Feb. 16, 1982, abandoned, which is a continuation of Ser. No. 86,331, Oct. 19, 1979, abandoned. This application Nov. 21, 1983, Ser. No. 553,429

Claims priority, application Japan, 53-147358; Oct. 26, 1978, 53-147359

Int. Cl.³ H01H 33/88

U.S. Cl. 200—148 A 2 Claims



1. A puffer type gas circuit breaker comprising:

a housing having a first end and a second end;

a rod-shaped stationary arcing contact immovably set at said first end of the housing and extending axially therefrom toward said second end of the housing;

a stationary puffer piston immovably set at said second end of the housing, at a distance from the stationary arcing contact and in axial alignment with the stationary arcing contact, and extending therefrom toward said first end of the housing;

a movable puffer cylinder having at a first end a forward end wall with a hole therethrough and at a second end an opening, said stationary puffer piston being inserted through said opening, thus defining a cylinder chamber between said forward end wall and said stationary puffer piston;

arc extinguishing gas filled in the cylinder chamber;

means for reciprocating the movable puffer cylinder in the axial direction thereof;

a substantially ring-shaped movable arcing contact attached to said first end of the movable puffer cylinder in axial alingment with the movable puffer cylinder, said stationary arcing contact being inserted into the movable arcing contact and thus put into slidable and electrical contact therewith when the movable puffer cylinder is moved in one direction and being pulled out of the movable arcing contact and thus put out of slidable and electrical contact therewith when the movable puffer cylinder is moved in the other direction;

conductor means for supplying the stationary and movable arcing contacts with current to be interrupted;

a cup-shaped nozzle made of electrically insulative material, positioned at said first end of the movable puffer cylinder, surrounding said movable arcing contact and extending coaxially with the movable puffer cylinder, a passage being formed between said cup-shaped nozzle and the movable arcing contact, said cup-shaped nozzle having at one end a throat through which the stationary arcing contact extends, said throat having a diameter larger than

that of the stationary arcing contact so that a ring-shaped gap is provided between the throat and the stationary arcing contact, and said cylinder chamber communicating with an area outside the cup-shaped nozzle through said ring-shaped gap, the passage between the cup-shaped nozzle and the movable arcing contact and the hole of said forward end wall;

a first arc resisting member made of arc resisting material, attached to that end face of the movable arcing contact which faces the throat of the cup-shaped nozzle and to that part of the inner periphery of the movable arcing contact which is continuous with said one end face;

a second arc resisting member made of arc resisting material and attached to the end of the stationary arcing contact extending toward said second end of the housing, said second arc resisting member extending to at least that portion of the stationary arcing contact which defines said ring-shaped gap with the throat of the cup-shaped nozzle, when the stationary arcing contact is moved relative to the movable arcing contact to a position where the stationary arcing contact leaves the movable arcing contact, the first arc resisting member and the second arc resisting member being in electric contact with each other even when the movable arcing contact is engaged with the stationary arcing contact to the deepest extent; and

main contact means connected in parallel to both arcing contacts for opening the external circuit before opening both arcing contacts;

whereby as long as said stationary and movable arcing contacts are kept in mutual contact, both arc resisting members contact each other, and arc generated only between the first and second arc resisting member when both arcing contacts leave each other is extinguished by arc extinguishing gas supplied from said cylinder chamber and flowing along said stationary arcing contact, the arc extinguishing gas passed through the arc being exhausted through said gap supplied at the time just after the movable arcing contact leaves the stationary arcing contact.

4,467,159

SELECTIVELY LOCKABLE PUSH SWITCH

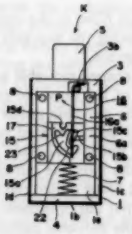
Yoshihiro Ota, Ichinomiya, and Mitsuo Kobayashi, Gifu, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Sep. 27, 1982, Ser. No. 424,562

Claims priority, application Japan, Oct. 19, 1981, 56-156215[U]

Int. Cl.³ H01H *13/64*

U.S. Cl. 200—153 J **10 Claims**



1. A multilever pushbutton switch comprising:

a switch casing having an inner wall;

a pushbutton knob;

an actuator having an external wall and mounted in the switch casing for relative movement of their respective walls, the actuator being moved by movement of the pushbutton knob;

means for biasing the actuator towards one end of the switch casing;

a camming face recessed in one of the inner wall of the switch casing and the external wall of the actuator;

a follower lever mounted on the other wall, of the actuator and the switch casing, which does not support the camming face, wherein the relative movement of the camming face and follower lever defines an operative movement of the pushbutton knob, to provide at least an off position, a first level on position and a second level on position;

means for biasing the follower lever against the camming face; and

contact terminals mounted within the switch casing for providing an electrical state of conductivity relative to the first level position and second level position, the camming face defining a first passage for the follower lever to sequentially provide, from an initial off position, a first level switch position and a second level switch position and a second passage for the follower lever defining only a second level switch position, the camming face including a projection mounted across the second passage to provide a perceptible resistance to passage of the follower lever while still permitting passage directly to the second level switch position upon continued movement of the pushbutton knob whereby an operator upon sensing the projection resistance can selectively permit the follower lever to move along the first passage by the release of the pushbutton knob to assume the first level position, or by continuing to press the pushbutton knob, the operator can force the switch to directly pass to the second level position in a single activation of the pushbutton knob.

4,467,160

LOW PROFILE SWITCH

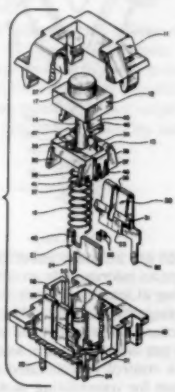
Gunter Murmann, Pegnitz, and Günter Bauer, Sulzbach-Rosenberg, both of Fed. Rep. of Germany, assignors to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jul. 12, 1983, Ser. No. 512,927

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3229465

Int. Cl.³ H01H *13/52, 3/12*

U.S. Cl. 200—159 A **24 Claims**



1. A switch, comprising:

housing means;

pushbutton means for slidingly reciprocating over a predefined keystroke distance in said housing means in response to the application and release of an operating force;

plunger body means having means for slidingly coupling to said pushbutton means so that the pushbutton means moves by itself over a predefined lost motion portion of said key stroke distance and carries said plunger body over the remaining portion of the key stroke distance;

spring means carried by said plunger body means for press-

ing against said housing means and resisting sliding movement of said plunger body means to provide a perceptible increase in operating force for moving the pushbutton means when the pushbutton means begins to carry the plunger body means;

at least one stationary electrically conducting contact means; and

at least one electrically conducting movable contactor means for flexing to make and break conductive contact with the stationary contact means;

said plunger body means including at least one cam means for holding said contactor means in spaced relation to said stationary contact means when no force is applied to the pushbutton and when the pushbutton moves over said lost motion portion, and allowing the contactor means to flex against the stationary contact means at a predefined activation point after the lost motion portion of the key stroke.

4,467,161

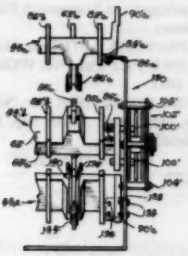
SWITCH APPARATUS

James W. Fox, Orland Park; Ronald J. Moery, Tinely Park, both of Ill., and Kenneth P. Banas, Munster, Ind., assignors to G & W Electric Company, Blue Island, Ill.

Filed Nov. 10, 1982, Ser. No. 440,612

Int. Cl.³ H01H 9/00

U.S. Cl. 200—281 **8 Claims**



1. In a high voltage type switch having a casing defining an internal chamber and having a plurality of service entrance terminals mounted on said casing, a multi-position switch mechanism mounted within said casing and including at least one electrically conductive contact support bar having a mounting portion and at least one electrically conductive contact blade having a mounting portion, electrical contact means mounted on said contact support bar, and support member means operatively associated with said conductive contact support bar and said conductive contact blade and operative to effect relative movement therebetween between positions wherein said contact blade is spaced from said electrical contact means and positions establishing electrical contact between said contact blade and said electrical contact means; the improvement wherein the mounting portion on said conductive contact blade and the mounting portion on said conductive contact support bar are substantially identically shaped, said support member means comprising first and second substantially identically shaped interchangeable nonconducting support members each of which is adapted for supporting cooperative relation with the mounting portion of either said conductive contact blade or said conductive contact bar; each of said interchangeable nonconducting support members including means for selectively mounting a plurality of said blade contacts or contact support bars thereon.

4,467,162

EXCITING ARRANGEMENT FOR INDUCTION HEATING PROCESS

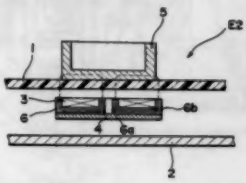
Shigeki Kondo, Tachikawa; Yoshio Yamazaki, Saitama; Tomofumi Iketani, Fuchu; Keiichiro Doi, Izumi, and Seiji Tanaka, Yamatokoriyama, all of Japan, assignors to Riccar Co., Ltd., Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Continuation of Ser. No. 270,104, Jun. 3, 1981, abandoned. This application Nov. 28, 1983, Ser. No. 555,417

Claims priority, application Japan, Jun. 13, 1980, 55-80436

Int. Cl.³ H05B 6/12

U.S. Cl. 219—10.49 R **10 Claims**



1. An induction heating apparatus of lightweight and reduced size which comprises

a top plate for receiving a container of magnetizable material to be heated, and

a bottom plate made of an iron material,

a heating coil disposed in spaced relationship between the top plate and the bottom plate, said heating coil being provided with a power source for impressing the heating coil with high frequency current,

a shielding plate member made of non-magnetizable metallic material disposed in a space between said heating coil and said bottom plate and having a size sufficient to cover the bottom portion of said heating coil, and

a coil support member made of highly magnetizable material providing a high electrical resistance, disposed between said heating coil and said shielding plate and covering the bottom portion and the peripheral edge portions of said heating coil for achieving improved magnetic flux efficiency, whereby the magnetic lines of flux produced by said heating coil pass through the coil support member and are radiated by the shielding plate back toward the container.

4,467,163

TEMPERATURE SENSING SYSTEM FOR MICROWAVE OVEN APPARATUS

John A. Pauly, and Richard W. Cenedella, both of Milford, Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 19, 1981, Ser. No. 226,259

Int. Cl.³ H05B 6/78

U.S. Cl. 219—10.55 F **1 Claim**

1. Microwave oven apparatus comprising:

housing means defining an oven chamber;

door means providing access to said chamber;

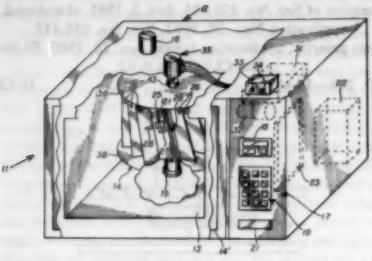
source means energizable to transmit microwave energy into said chamber;

rotary support means positioned within said chamber and defining an annular arrangement of stations each adapted to receive an article to be heated, said support means comprising a plurality of planar trays each defining one of said stations and adapted to support an article therein;

a plurality of temperature responsive thermistor sensors, one disposed in each of said stations;

an electrically conductive sensor body enclosing each of said sensors, each of said sensor bodies being centrally supported in said chamber and extending radially into one of said stations so as to be straddled by one of said trays and

an article supported thereby, and each body comprising an elongated planar surface substantially parallel to one of said trays so as to engage an article positioned in the station it occupies and each sensor body having a length that establishes therefor a detuned antenna condition at the microwave transmission frequency of said source means;



a plurality of electrical insulators each isolating one of said thermistors from a said body;

a substantial mass of thermally conductive material disposed between each of said bodies and said insulation; and

an electrical control circuit adapted to automatically deenergize said source means in response to the sensing of a temperature above a predetermined threshold by any of said sensors.

4,467,164

ELECTRONIC CONTROLLED HEAT COOKING APPARATUS AND METHOD OF CONTROLLING THEREOF

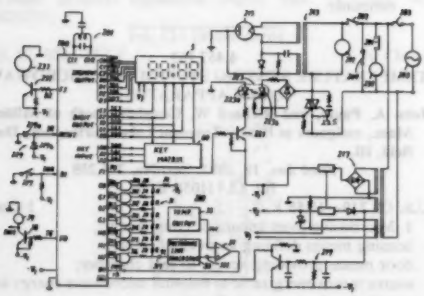
Takeshi Nakata, Otsu; Hitoshi Takase, Hirakata, and Atsushi Horinouchi, Otsu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Division of Ser. No. 109,350, Jan. 30, 1980, Pat. No. 4,383,157. This application Sep. 10, 1982, Ser. No. 416,464

Claims priority, application Japan, Jan. 20, 1979, 54-5761

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 M **10 Claims**



1. A microwave oven, comprising input means for commanding a defrosting operation, microwave generating means for providing heating energy to a material being defrosted, temperature measuring means for measuring a temperature of said material being defrosted, and controlling means, responsive to a command of said defrosting operation by said input means and to the temperature measured by said temperature measuring means, for controlling said microwave generating means to produce a first relatively high energy intensity during a first part of said defrosting operation until the temperature of said material being defrosted coincides with a first predetermined temperature, and to produce at least one lower energy intensity during a second part of said defrosting operation if and when the temperature of said material being defrosted exceeds said first predetermined temperature, and to end said defrosting operation if and when the temperature of said material being defrosted coincides with a second predetermined temperature,

said first energy intensity being selected to provide a level of heating energy which, if applied to said material after it has been partially thawed, would result in uneven defrosting of said material;

said first temperature being selected in cooperation with said first energy intensity so that if and when the temperature of said material being defrosted reaches said first temperature the material will be partially thawed and partially frozen;

said at least one lower energy intensity being selected to provide a level of heating energy which permits even defrosting of said material from the partially thawed and partially frozen state to a completely thawed state, and

said second temperature being selected in cooperation with said at least one lower energy intensity so that if and when the temperature of said material being defrosted reaches said second temperature the material will be completely thawed, without substantial additional cooking taking place during said defrosting operation.

4,467,165

INDUCTION HEATING APPARATUS

Mitsuyuki Kiuchi, Minoo, and Takumi Mizukawa, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

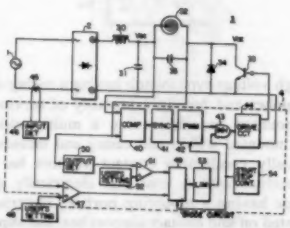
PCT No. PCT/JP80/00208, § 371 Date May 18, 1981, § 102(e) Date May 18, 1981, PCT Pub. No. WO81/00801, PCT Pub. Date Mar. 19, 1981

PCT Filed Sep. 12, 1980, Ser. No. 269,059

Claims priority, application Japan, Sep. 17, 1979, 54-119663; Dec. 18, 1979, 54-165049

Int. Cl.³ H05B *6/08*

U.S. Cl. 219—10.77 **8 Claims**



1. An induction heating apparatus comprising a rectifier for rectifying a voltage from an AC mains supply, a resonance circuit formed by an induction heating coil and a capacitor, a switching transistor having an emitter-collector path connected in circuit with said heating coil to the output of said rectifier, a diode connected in anti-parallel relationship with said transistor, first means for generating a power control signal having a manually adjustable magnitude, second means for detecting when a voltage developed at a junction between the collector of said transistor and one end of said heating coil becomes lower than a voltage developed at the other end of said heating coil, and third means for generating in response to the occurrence of an output signal from said second means a trigger pulse of a variable duration adjustable as a function of said power control signal and applying said trigger pulse to the base of said transistor so that the frequency of oscillations

generated in said resonance circuit is inversely proportional to said manually adjustable magnitude.

4,467,166

WIRE-CUT ELECTRIC DISCHARGE MACHINING CONTROL METHOD

Gotaro Gamo, and Mitsuo Kinoshita, both of Hachioji, Japan, assignors to Fanuc Ltd., Tokyo, Japan

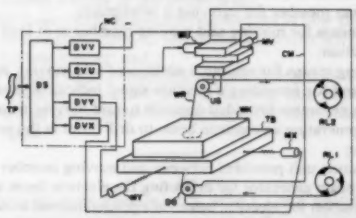
PCT No. PCT/JP81/00271, § 371 Date May 26, 1982, § 102(e) Date May 26, 1982, PCT Pub. No. WO82/01147, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 8, 1981, Ser. No. 385,377

Claims priority, application Japan, Oct. 8, 1980, 55-141061

Int. Cl.³ B73P *1/08*

U.S. Cl. 219—69 W 7 Claims



1. A wire-cut electric discharge machining control method for taper cutting a workpiece to provide a tapered surface of oblique cylindrical shape between a first tapered surface lying in a first plane and an adjacent second tapered surface lying in a second plane that intersects said first plane by moving the workpiece in a third plane relative to the wire, the first plane intersecting the third plane at a predetermined taper angle and the second plane intersecting the third plane at substantially the same taper angle, and moving an upper or lower guide from which the wire is stretched in a fourth plane that is substantially parallel to the third plane, said tapered surface of oblique cylindrical shape being configured as a portion of a cylinder having an axis which extends through said third plane and is parallel to both said first and second planes and having a surface which is tangent to both said first and second planes, comprising the steps of: entering command data corresponding to the radius of said oblique cylindrical tapered surface in addition to positional control information for cutting the first and second tapered surfaces into anumerical control device; determining points Q and R on a commanded path lying in said third plane where the tapered surface of oblique cylindrical shape comes into tangential contact with the first and second tapered surfaces, respectively, using said positional control information and radius; and taper cutting to provide the tapered surface having an oblique cylindrical shape by cutting the first tapered surface until the wire arrives at said point Q, then cutting the oblique cylindrical tapered surface by moving the workpiece along the arc QR with the wire held fixed, and subsequently cutting the second tapered surface from point R.

4,467,167

EDM CONTROLLER FOR PROVIDING A ROCKING MOTION TO THE ELECTRODE FOR FINISH MACHINING

Toshiro Oizumi; Tetsuro Ito, and Shigeo Yamada, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

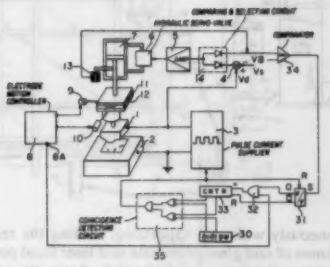
Division of Ser. No. 232,030, filed as PCT JP 80/00112, published as WO 80/02665, Dec. 11, 1980, § 102(e) dated Jan. 29, 1981, Pat. No. 4,370,537.

This application Sep. 23, 1982, Ser. No. 422,087

Claims priority, application Japan, May 30, 1979, 54-67255; May 30, 1979, 54-67256; May 30, 1979, 54-67257; May 30, 1979, 54-67258; May 30, 1979, 54-67259

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 C 13 Claims



1. An electric discharge machine comprising:

an electric power source means for supplying electric discharged machining energy;

an electrode;

a workpiece holding means for holding a workpiece;

feeding means for effecting the relative feeding motions of said electrode and said workpiece in a certain direction;

rocking means operatively associated with said electrode for effecting a relative rocking motion in said electrode having a directional component perpendicular to said certain direction;

connecting means coupled to said electric power source means and said electrode for providing said electric discharge machining energy when said rocking means is rocking said electrode;

position detecting means for detecting that said electrode and said workpiece take a predetermined positional relationship in said certain direction;

gap voltage detecting means coupled to said electrode for generating a gap signal when the voltage at the machining gap between said electrode and said workpiece is larger than a predetermined reference level;

signal continuation detecting means for detecting that said gap voltage detecting means has continuously generated said signal for longer than a predetermined time period after said position detecting means has detected said predetermined positional relationship, whereby said rocking machining operation is accomplished until said signal continuation, detecting means detects a longer continuation of said signal generation than said predetermined time period.

4,467,168

METHOD OF CUTTING GLASS WITH A LASER AND AN ARTICLE MADE THEREWITH

George M. Morgan, and Dale R. Hinkens, both of Fairfield, Iowa, assignors to Creative Glassworks International, Fairfield, Iowa

Filed Apr. 1, 1981, Ser. No. 249,854

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LG 20 Claims

1. Method of cutting glass having a predetermined thickness

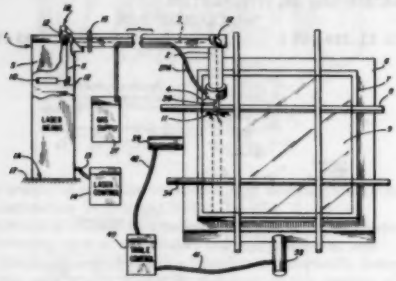
with laser means having a laser beam output, said method comprising

superposing the glass in predetermined spaced relationship with respect to a support means;

directing laser means so that a laser beam generated thereby is incident upon said glass, said laser means having a predetermined energy output;

focusing said laser beam to a focal point proximate the surface of said glass to locally heat said glass proximate said focal point;

vaporizing a first thickness of said glass proximate said laser focal point, said first thickness being less than the total glass thickness;



simultaneously with said vaporizing, heating the remaining thickness of said glass proximate said laser focal point, said remaining thickness being heated above its annealing temperature;

directing a jet of gas so that it is incident upon the proximity of said laser focal point, said jet cooperating with said beam to remove said vaporized and said heated glass proximate said laser focal point to create a hole through said glass; and

effecting movement between said glass and said laser focal point and gas jet along a predetermined path at a predetermined rate, maintaining said focal point at or about the surface of said glass during any movement, thereby defining a cut through the entire thickness of said glass.

4,467,169

CYLINDER LINER

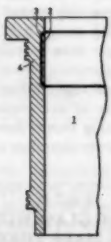
Takeshi Hiraoka; Shigeru Urano, both of Saitama, and Kiyoshi Yamamoto, Chiba, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,345

Claims priority, application Japan, Apr. 2, 1981, 56-48458

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EB **6 Claims**



1. A cylinder liner, comprising; a cylindrical parent metal liner body having a white cast iron layer formed on the inner peripheral surface thereof, said layer being formed in an area surrounding a top dead center position of a piston within said cylinder, and a thermally effected layer underlying said white cast iron layer, said white cast iron layer and said underlying layer being formed by irradiating a substantially finished surface of said liner body with high density heat from a heat source, and cooling said surface.

4,467,170

ELECTRON BEAM DRILLING APPARATUS

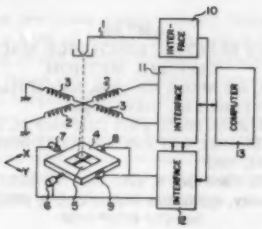
Seiji Hata, Fujisawa; Takao Terabayashi, Yokohama; Noriyoshi Arakawa, Fujisawa, and Makoto Watanabe, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,666

Claims priority, application Japan, Jun. 17, 1981, 56-92275

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 EH **8 Claims**



1. An electron beam drilling apparatus, comprising:

a moving member for carrying a workpiece;

drive means for moving said moving member in at least one direction;

detecting means for sensing a position of said moving member and for providing a position signal indicative thereof;

a beam generator provided opposite to said moving member for generating an electron beam to drill holes in the workpiece;

a deflection unit provided between said moving member and said beam generator for deflecting the electron beam so as to position the electron beam on a predetermined location of the surface of the workpiece;

a computer for storing position data of the holes to be drilled and for determining a timing instruction for generation of the electron beam from the position signals of said moving member supplied by said detecting means and the position data of the holes;

a target position setting circuit for storing the timing instruction supplied by said computer; and

comparing means for comparing current position signals of said moving member from said detecting means with the timing instruction from said target position setting circuit and for supplying a deflecting instruction to said deflection unit so that the holes are drilled in the workpiece at a high speed with a high precision.

4,467,171

LASER CUTTING NOZZLE

Terry J. Ramos, Brentwood, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 429,921

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LG **7 Claims**

1. A laser cutting nozzle for attachment to a laser cutting apparatus providing a directed and focused laser beam for cutting a work piece, comprising:

a substantially cylindrical hollow body;

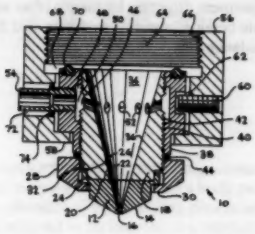
a conical hollow tip mounted to the lower end of the body, the tip having a small aperture at its apex;

a retaining ring holding the body and tip together;

the hollow body and coincal tip together defining a hollow interior therethrough ending at the aperture in the tip, the laser beam being directed through the hollow interior and aperture in the tip, the laser beam being directed through the hollow interior and aperture to a work piece;

the hollow interior being shaped substantially conical with its apex at the aperture in the tip, to substantially match the profile of the laser beam at full beamwidth, the angle of the cone being approximately 30°;

the hollow body further having a plurality of gas inlet holes therethrough oriented to produce a coaxial flow of gas through the hollow interior and through the aperture in the tip;



an alignment ring to which the body is mounted and defining therebetween a gas containment channel, the gas inlet holes communicating from the containment channel to the hollow interior of the nozzle body;

inlet means in the alignment ring adapted to flow gas into the containment channel, and through the inlet holes into the hollow interior; and

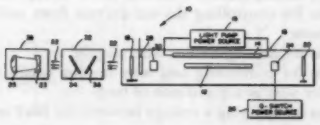
an adapter ring to which the alignment ring is mounted, and which is adapted to hold a focusing lens assembly and which is adapted to be attached to the laser cutting apparatus.

4,467,172

METHOD AND APPARATUS FOR LASER ENGRAVING DIAMONDS WITH PERMANENT IDENTIFICATION MARKINGS

Jerry Ehrenwald, 4001 Judith La., Oceanside, N.Y. 11572, and Carl B. Miller, Jr., Saddle Brook, N.J., assignors to Jerry Ehrenwald, Oceanside, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,329
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LH **17 Claims**



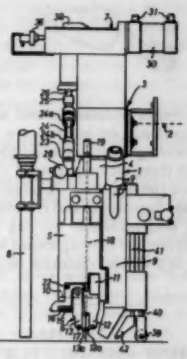
1. A laser apparatus for inscribing permanent markings selectively on or below a target surface comprising a source of coherent electromagnetic radiation in a continuous mode having a fundamental radiation frequency, resonator means including an optical cavity, switch means for transmitting short duration pulses of said radiation from the cavity, fixed focus optical means including short focal length objective lens means for directing the transmitted radiation to a focussed spot at the target surface, conversion means within the optical cavity for modifying the radiation wave length to conform with the focal length of the lens means, said conversion means including a harmonic crystal generator providing a multiple harmonic of the fundamental radiation frequency with the converted wave length being compatibly focusable by the lens means for providing a shallow penetration depth in the target surface.

4,467,173

WELDING HEAD FOR NARROW GAP WELDING

Börje R. Lundin, Laxå, Sweden, assignor to ESAB AB, Göteborg, Sweden

Filed Mar. 11, 1982, Ser. No. 357,301
Claims priority, application Sweden, Mar. 17, 1981, 8101675
Int. Cl.³ B23K *9/225*
U.S. Cl. 219—125.12 **6 Claims**



1. A welding head for depositing a weld in a narrow gap formed by opposing walls of two work pieces to be joined and having a longitudinal extent, the gap having a depth of at least 50 mm and a width of at most 25 mm comprising:

(A) a body;

(B) a flat-shaped nozzle holder having a guide for a fusible wire electrode, said nozzle holder being rigidly attached to said body;

(C) a pivotable contact nozzle being laterally pivotable with respect to the longitudinal extent of the gap about a first shaft connecting said contact nozzle to the lower end of said nozzle holder, said pivotable contact nozzle and at least the part of the holder that carries the first shaft being fully insertable into the gap;

(D) operating means;

(E) means for connecting the operating means to said contact nozzle, said connecting means including a second shaft disposed in parallel with the plane of the flat-shaped nozzle holder and joint means being adapted to convert a limited turning movement impressed on the second shaft by said operating means into a corresponding pivotal movement of the contact nozzle about said first shaft.

4,467,174

REMOTE CONTROL OF OPEN CIRCUIT VOLTAGE IN A WELDING POWER SUPPLY

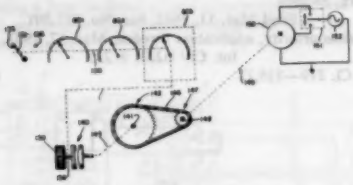
Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30060

Division of Ser. No. 236,037, Feb. 19, 1981, Pat. No. 4,392,045.
This application Apr. 11, 1983, Ser. No. 483,811
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—132 **2 Claims**

1. In a three-phase welding power supply arranged to provide welding current to a remote welding location including a manually-adjustable three-element ganged variable control impedance device for selectively varying the open circuit voltage of said power supply, one of said elements being connected to control a contribution to said open circuit voltage

from each respective one of said three phases, the improvement of a remote control arrangement for remotely varying said open circuit voltage comprising in combination:

a set of three independently adjustable variable impedance elements, one each of which is connected to a respective element of said three-element ganged variable controlled impedance for setting limit to said contribution to said open circuit voltage of each said respective one of said three phases;



a slip clutch means coupled to said three element ganged variable impedance device and to a driving link;

a reversible moving means coupled to said driving link for moving said three element ganged variable control impedance device through said slip clutch; and

a control means disposed at said remote welding location for controlling said reversible moving means to selectively more said reversible moving means in a first direction and alternately in a second direction opposite said first direction.

4,467,175

ADJUSTMENT ASSEMBLY FOR THE ROTARY TORCHHEAD OF AN ELECTRICAL WELDING GUN

Holger Reeh, Germering, and Josef Geiss, Haar, both of Fed. Rep. of Germany, assignors to Mathilde Reeh, Germering, Fed. Rep. of Germany

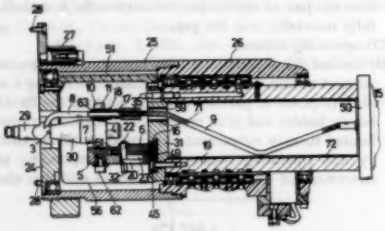
PCT No. PCT/DE81/00132, § 371 Date Apr. 26, 1982, § 102(e) Date Apr. 26, 1982, PCT Pub. No. WO82/00788, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 28, 1981, Ser. No. 375,289

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032602

Int. Cl.³ B23K *9/28*

U.S. Cl. 219—137.31 **8 Claims**



1. An electrical welding gun comprising a rotary torchhead rotatable about a rotation axis by means of a drive shaft having a front plate, to which said torchhead is attached, a torchholder supporting a welding electrode, a wire feed tube for feeding a filler wire, said wire feed tube ending in a filler wire nozzle, and an adjustment assembly on said rotary torchhead for adjustment of the torchholder in a first adjustment direction parallel to the rotation axis of the torchhead by means of a longitudinal slide and in a second adjustment direction perpendicular to the rotation axis of the torchhead by means of a cross slide, for swivel adjustment of the torchholder about a first swivel axis perpendicular to the rotation axis of the torchhead and to said second adjustment direction by means of a first swivel spindle, for adjustment of the filler wire nozzle parallel to the rotation axis of the torchhead and perpendicular thereto, and for swivel adjustment of the filler wire nozzle about a second swivel axis perpendicular to the rotation axis of the torchhead and to said second adjustment direction by means of a second swivel spindle wherein the filler wire nozzle is held in a swivel holder which is swivellably adjustably supported on the torchholder by means of said second swivel spindle and the torchholder is swivellably adjustably supported on the longitudinal slide by means of said first swivel spindle and the longitudinal slide is adjustably guided in said first adjustment direction on the cross slide to be adjustable in said first adjustment direction by means of an adjusting means, the cross slide being adjustably guided in said front plate in an undercut guidance slot.

4,467,176

HOT-WIRE ARC WELDING APPARATUS

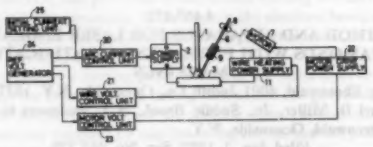
Takaji Mizuno; Yoshiaki Kato, and Takao Shimizu, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,712

Claims priority, application Japan, Jan. 11, 1982, 57-2529

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—137.71 **3 Claims**



1. A hot-wire arc welding apparatus comprising:

a nonexpendable electrode;

means for supplying an arc current to ignite an arc between said nonexpendable electrode and a workpiece;

means for controlling the arc current from said supplying means;

means for feeding a filler wire into the arc;

means for controlling said wire feeding means to feed the filler wire at a given rate of feed;

means for applying a voltage between the filler wire and the workpiece;

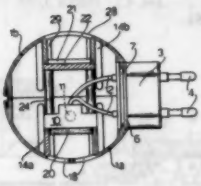
means for controlling the voltage from said voltage applying means; and

means for generating a reference voltage which increases gradually with time, each of said arc current control means, said wire feed control means, and said wire voltage control means being connected to said reference voltage generating means and being responsive to the output voltage therefrom, said arc current control means, said wire feed control means and said wire voltage control means operating in response to said output voltage such that said arc current, said rate of filler wire feed and said voltage applied to said filler wire are gradually increased in substantial synchronism.

4,467,177
HEATING DEVICE FOR TABLETS CONTAINING EVAPORABLE SUBSTANCES AT DIFFERENT TEMPERATURES

Fulvio Zobele, Trento, Italy, assignor to Zobele Industrie Chimiche S.p.A., Trento, Italy

Filed Mar. 1, 1983, Ser. No. 471,194
Claims priority, application Italy, Mar. 26, 1982, 21356/82[U]
Int. Cl.³ A61L 9/03
U.S. Cl. 219—271 7 Claims

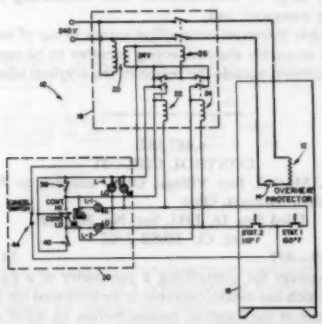


1. A heating device for tablets containing substances evaporable at different temperatures, including a body provided with a pin support, a plurality of electric plug pins mounted to said pin support and adapted to be inserted in a voltage socket, and with a first seat for positioning of at least one heating support of insulating material, in which at least one electrical heating element is positioned, the ends of which are connected respectively to the pins, said body being provided with at least one slit for the positioning of an evaporable tablet at a first distance from said heating element, and comprising means for providing at least one additional seat for the positioning of at least one further tablet at a second distance from said heating element greater than said first distance.

4,467,178
CONTROL SYSTEM FOR REGULATING WATER HEATER OPERATION IN ACCORDANCE WITH ANTICIPATED DEMAND

Elro M. Swindle, P.O. Box 628, Millbrook, Ala. 36054

Filed Mar. 26, 1982, Ser. No. 362,289
Int. Cl.³ H05B 1/02; G05D 23/19; F24H 1/00
U.S. Cl. 219—330 7 Claims



1. A control system for selectively regulating the operation of a fluid heating tank having heating means to heat the fluid in accordance with anticipated demand for the heated fluid, comprising:

first temperature sensing means for sensing the temperature of the fluid within a tank and providing a signal when said temperature is below a first predetermined level;

second temperature sensing means for sensing the temperature of the fluid within the tank and providing a signal when said temperature is below a second predetermined level, said second predetermined level being higher than said first predetermined level;

relay means adapted to be electrically connected to the heating means of the tank and arranged to activate the heating means when energized;

first and second holding circuits for said relay means;

a remote control unit including a control panel located remotely of the tank;

a three-position switch means on the panel and connected in circuit with the relay means and the first and second temperature sensing means and arranged to provide selective operation of the heating means in any of three modes including:

(a) a first position wherein the relay means is continuously energized under the control of the first temperature sensing means for continuous operation of the heating means to provide heated fluid at said first temperature;

(b) a second position wherein the relay means is continuously energized under the control of the second temperature sensing means for continuous operation of the heating means to provide heated fluid at said second temperature; and

(c) a third position permitting selective "one-time" operation of the heating means;

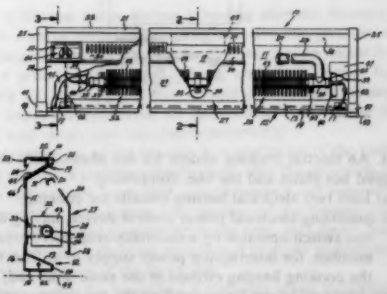
first and second control switches on said control panel, said first control switch being arranged to actuate the first holding circuit to thereby energize the relay means when the three-position switch is in its third position to activate the heating means, the first temperature sensing means being arranged in series with the first holding circuit to break the first holding circuit upon attainment of the first temperature level in the tank, and with said second control switch being arranged to actuate the second holding circuit to thereby energize the relay means when the three-position switch is in its third position to activate the heating means, the second temperature sensing means being arranged in series with the second holding circuit to break the second holding circuit upon attainment of the second temperature level in the tank; and

signal means on the control panel to provide a remote indication of the fluid temperature in the tank and the condition of activation of the heating means.

4,467,179
PORTABLE ELECTRIC BASEBOARD HEATER HAVING AN INTEGRAL HANDLE

Rafath Ali, Chesterfield, and Thomas D. Vaughn, Ballwin, both of Mo., assignors to Intertherm Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 378,508, May 17, 1982,. This application Sep. 7, 1982, Ser. No. 415,313
Int. Cl.³ F24H 9/02; H05B 3/02
U.S. Cl. 219—368 2 Claims



1. For supplying heated air by convection, a portable baseboard heater comprising a unitary back plate, extending the

length of the heater having a central straight vertical portion, bounded by a lower integral hollow generally triangular closed box-like portion having a forward surface sloping downward and forward from a junction with said central portion, and having a pair of ports through said sloping surface, one positioned adjacent to each end of the baseboard heater, and by an upper integral generally triangular portion having a forward surface sloping upward and forward from a junction with said central portion to a horizontal top surface extending aft to an integral vertical flange formed downwardly in substantially the same plane as said straight central portion and terminating spacedly thereabove in a forward turned margin, whereby to provide a horizontal opening aft of said forward and upward sloping surface of the back plate, together with thermally insulative non-metallic internal handle means in the space between the said top surface and the said upper forwardly sloping surface and accessible through said horizontal aft opening, whereby to permit lifting the heater while in operation, and means at both ends of said back plate to support it spacedly above a floor plane of support, whereby said back plate serves as a structural beam to resist loads applied to said heater intermediate its ends, in combination with a forward plate-like member supported spacedly forward of the central portion of the back plate, a straight elongated electrical resistance finned tube assembly supported by said back plate behind the forward plate in a position between said upper and lower triangular portions, said finned tube assembly being of the type having opposite electric terminal ends, and electrical connector means connecting said terminal ends and extending through said ports and lower box-like portion, whereby said closed box-like portion serves as a protective wiring raceway and affords strength and deflection-resistance to the baseboard heater.

4,467,180

ELECTRIC COOKING SYSTEM

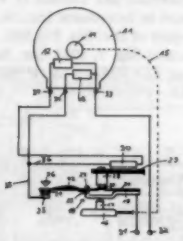
Karl Fischer, Am Gänsberg 23, 7519 Oberderdingen, and Felix Schreder, Oberderdingen, both of Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,670

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3140074

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—449 **11 Claims**



1. An electric cooking system for hot plates, glass ceramic topped hot plates and the like, comprising:

at least two electrical heating circuits for cooking;

a quantizing electrical power control device, having at least one switch operable by a thermally responsive expansion member, for interrupting power supply to at least two of the cooking heating circuits at the same time; and,

an electrical heater for controlling the expansion member of the at least one switch, the electrical heater being connected in series with at least one of the cooking heating circuits.

4,467,181

ELECTRIC HOTPLATE

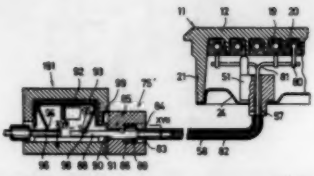
Karl Fischer, Am Gänsberg, D-7519 Oberderdingen, and Felix Schreder, Oberderdingen, both of Fed. Rep. of Germany, assignors to Karl Fischer, Oberderdingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 177,873, Aug. 14, 1980, Pat. No. 4,348,581. This application Aug. 25, 1982, Ser. No. 411,458

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933296

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—451 **19 Claims**



1. An electric hotplate, comprising:

a hotplate member;

electrical heating resistor means for heating at least a zone of said hotplate member;

a covering sheet covering at least the underside of the heated zone of said hotplate, including said heating resistor means, the sheet having an opening therethrough;

a plurality of flexible, thermally and electrically insulated electrical connection means, each being electrically connected at one end to said heating resistor means and extending through said opening for connecting said heating resistor means to a source of electrical energy;

a connecting member for mechanically connecting said flexible electrical connection means to one another near their other ends, said connecting member being freely movable relative to said hotplate member in all directions, limited only by the length of said electrical connection means;

said covering sheet having an upwardly projecting depression angularly displaced from said opening and sufficiently large to accommodate said connecting member during transport; and,

said flexible electrical connection means being of sufficient length to enable the connecting member to be operationally mounted outside the region of the hotplate after transport.

4,467,182

CONTROL CIRCUIT

Stephen L. Merkel, Bay Village, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 16, 1981, Ser. No. 301,732

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **16 Claims**

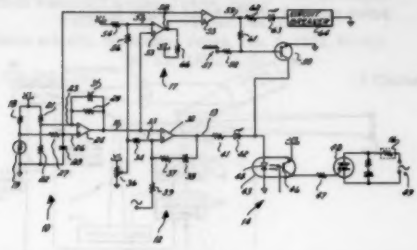
1. In a system for controlling a parameter at a particular location, which has means operable to be activated for altering the parameter at the location, means, having an input, responsive to a control signal at the input for activating the parameter altering means, means, having an output, for sensing the parameter at the location and for producing a sensed parameter signal at the output, and a control circuit coupled to the output of the parameter sensing means and to a parameter set point signal and operable to produce an intermittent control signal, coupled to the input of the activating means, which is proportional to the difference between the two control circuit inputs, an improved control circuit comprising:

a comparator circuit having a first input coupled to the output of the parameter sensing means and second input

coupled to a parameter set point signal and having an output coupled to the input of the activating means;

feedback means for conditioning the comparator circuit to produce an intermittent pulse signal at its output when its inputs are substantially equal; and

means for coupling an a-c ripple voltage signal to one of the comparator inputs, said a-c ripple voltage supplied from



an a-c source via a voltage attenuator such as a resistor to said one of the comparator inputs, whereby a band of values of the difference between the comparator inputs established by the amplitude of the a-c signal results in the production of an intermitten pulse signal at the output of the comparator with the pulse duration dependent upon said difference.

4,467,183

LIQUID TEMPERATURE CONTROL APPARATUS COMPRISING INITIAL TEMPERATURE DEPENDENT HIGH POWER HEATER DRIVE

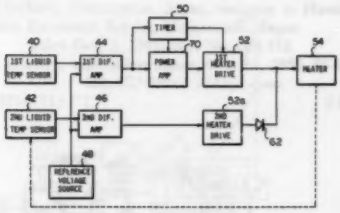
Kazumi Ishima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,981

Claims priority, application Japan, Dec. 19, 1980, 55-178788; Dec. 19, 1980, 55-178789; Dec. 19, 1980, 55-178790; Dec. 19, 1980, 55-178791; Dec. 19, 1980, 55-178792; Dec. 19, 1980, 55-178793

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **22 Claims**



1. A liquid temperature control apparatus for controlling the temperature of a liquid to a predetermined level comprising:

heater means for heating the liquid;

reference means for producing a reference output signal indicative of the predetermined level;

first sensor means for sensing an initial temperature of the liquid upon energization of the apparatus to produce a first sensing output signal indicative of the initial temperature level;

first differential amplifier means for comparing the first sensing output signal with the reference output signal to produce a first differential output signal representing the difference between the predetermined level and the initial temperature level;

second sensor means for sensing a controlled temperature of the liquid which is being heated by the heater means to produce a second sensing output signal indicative of the varying controlled temperature level;

second differential amplifier means for comparing the second sensing output signal with the reference output signal to produce a second differential output signal representing the difference between the predetermined level and the varying controled temperature level;

timer means for producing a pulse output signal upon energization of the apparatus;

heater drive circuit means for initially applying a high drive power to the heater means in response to the pulse output signal from the timer means for a pulse duration of the timer means and for subsequently producing a heater drive power output signal in response to the second differential output signal to apply a variable heater drive power to the heater means, the high drive power being higher than the variable heater drive power; and

control means for controlling the timer means and the heater drive circuit means such that at least one of the pulse duration of the timer means and the high drive power of the heater drive circuit means is varied depending on the first differential output signal.

4,467,184

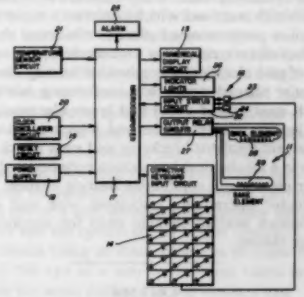
THERMAL RANGE CONTROL

Mark C. Loessel, Mishawaka, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 27, 1982, Ser. No. 423,738

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—506 **10 Claims**



1. In a thermal range having a heating element, manually operable control means for causing selective energization of the heating element during a cooking period, timing means for timing a preselected cooking period, and alarm means for providing an alarm at the end of said preselected cooking period, improved apparatus for preventing overcooking of food by said range, said apparatus comprising:

de-energizing means for causing de-energization of the heating element a preselected delay time after the provision of the alarm in the event said control means is not manually operated to discontinue energization of the heating element within said preselected delay time, said delay time being of a short duration preselected to avoid undesirable further cooking of the food; and

reminder means for providing a reminder alarm indicating the operation of said de-energizing means to de-energize the heating element until manual operation of the control means to a de-energizing condition is effected.

4,467,185

HEATER FOR HOT ISOSTATIC PRESSING APPARATUS

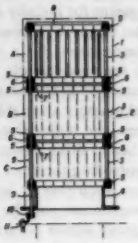
Masato Moritoki, Miki; Takao Fujikawa, and Junichi Miyanaga, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 27, 1982, Ser. No. 437,023

Claims priority, application Japan, Oct. 28, 1981, 56-161806[U]

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—539 **7 Claims**



1. A heater for use in a hot isostatic pressing apparatus which isostatically compresses a heated workpiece in a high temperature and high pressure gas atmosphere, said heater comprising:

at least two electrically conductive heating element units having generally a self-standing cylindrical shape and stacked one on another to define a series of at least two cylindrical heating zones, wherein said heating element units each further comprise a grid-like structure alternately having a vertically disposed portion and a horizontally extending bridge portion;

a plurality of insulator blocks fitted on ends of said upper and lower cylindrical electrically conductive heating element units which meet and which comprise a material having a sufficient predetermined electric resistance that will not conduct electric current at a maximum operating temperature of said electrically conductive heating element units;

an annular shaped connector conforming with said ends which meet of said upper and lower electrically conductive heating element units and which is interposed between said insulator blocks on said ends which meet so as to form a mechanical connection between said upper and lower electrically conductive heating element units; and

a conductor operatively associated with said electrically conductive heating element units for supplying heating power thereto.

4,467,186

MIRROR ACTUATOR CONTROL SYSTEM

Norman S. Goralnick, Lexington, and George H. McLellan, Jr., Wilmington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,041

Int. Cl.³ G01J *1/20*; G05D *23/275*; G05B *21/02*

U.S. Cl. 250—201 **10 Claims**

1. A mirror actuator control system comprising in combination:

means for sensing a wavefront tilt angle, said wavefront tilt angle sensing means providing a wavefront tilt angle signal,

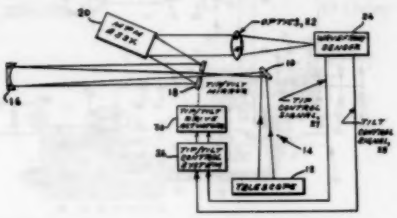
means for sensing a mirror tilt angle, said mirror tilt angle sensing means providing a mirror tilt angle signal,

means for comparing said wavefront tilt angle signal with said mirror tilt angle signal, said comparing means providing a tilt error signal,

a wavefront sensor means sampling and quantizing said tilt error signal, said wavefront sensor means providing a tilt correction signal,

a gain unit having a predetermined gain factor, said gain unit amplifying said tilt correction signal by said gain factor;

a compensation network receiving said tilt correlator signal, said compensation network maintaining the signal level with a predetermined range, said compensation network compensating for the mechanical system natural frequency, said compensation network reducing the high frequency noise in said tilt correction signal, said compensation network providing an output signal,



a drive amplifier receiving the output signal from said compensation network, said drive amplifier having a correct gain to provide a lag beyond the loop crossover frequency, said drive amplifier providing a current signal, and,

an actuator means receiving said current signal and providing a torque in response thereto, said torque being applied to a mirror to change its tilt angle.

4,467,187

AUTOMATIC FOCUSING DEVICE WHICH INHIBITS FOCUSING WHEN A LOW CONTRAST SCENE IS SENSED

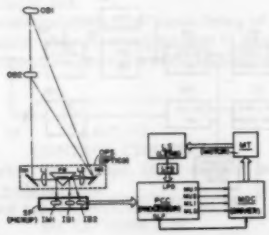
Tokuichi Tsunekawa, Yokohama, and Takashi Amikura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,413

Claims priority, application Japan, Aug. 22, 1980, 55-115412

Int. Cl.³ G03B *3/10*

U.S. Cl. 250—204 **11 Claims**



1. An automatic focusing device comprising:

sensing means for sensing an image of an object and for generating a plurality of signals therefrom;

control means for generating a control signal;

focusing means for focusing an optical system on the basis of the plurality of signals from said sensing means, said focusing means focusing the optical system only when said focusing means continuously detects the control signal for a predetermined time period; and

inhibiting means having a detection period shorter than the predetermined time period, said inhibiting means detecting each of the plurality of signals from said sensing means in each detection period and inhibiting the focusing means

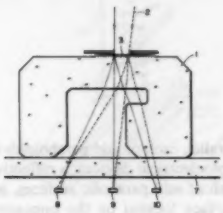
when the plurality of signals from said sensing means are at predetermined conditions.

4,467,188

DEVICE FOR SPLITTING LIGHT FROM AN OBJECTIVE LENS

Takashi Suzuki, Yokohama; Nozomu Kitagishi, Inagi, and Susumu Matsumura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,883
Claims priority, application Japan, Jan. 6, 1981, 56-565
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **4 Claims**



1. A beam splitting device for causing a plurality of sensors disposed in the vicinity of a predetermined imaging plane of an objective lens to detect images of different imaging states, respectively, comprising:

light splitting means for splitting the light beam from the objective lens into a plurality of light beams, said splitting means having a light incidence surface disposed orthogonally with respect to the optical axis of the objective lens, said surface being formed with a grating of surface relief structure; and

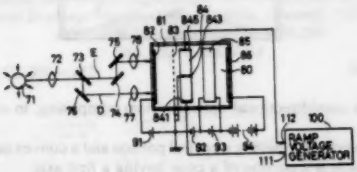
optical means for establishing different optical path lengths for the split beams between said splitting means and the sensors, said optical means being disposed between said splitting means and the sensors so as to provide different effects on the plurality of split beams, respectively.

4,467,189

FRAMING TUBE AND FRAMING CAMERA

Yutaka Tsuchiya, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 2, 1981, Ser. No. 308,172
Claims priority, application Japan, Oct. 14, 1980, 55-143984
Int. Cl.³ H01J *31/50*
U.S. Cl. 250—213 VT **2 Claims**



1. A framing tube which comprises:

a cylindrical airtight vacuum container, the container being provided with a photocathode at one end thereof and a fluorescent screen at the other end thereof in such a manner as to face said photocathode;

a shutter plate disposed between and parallel to the surface of the photocathode and fluorescent screen in said container, the shutter plate having a multiplicity of through holes perforated perpendicular to the surface thereof and at least three electrodes disposed at right angles with the axis of the through holes and spaced parallel to each other, the electrodes dividing the surface of the shutter plate into a plurality of sections; and

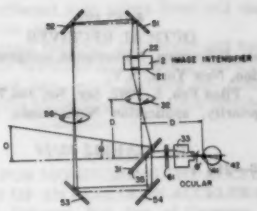
a polarity reversing ramp generator connected to said electrodes to supply lagging ramp voltage to each of the electrodes, the ramp voltage developing an electric field across the axis of the through holes in the shutter plate and thereby controlling the passage of the electron beams from the photocathode through the through holes.

4,467,190

NIGHT-VISION EQUIPMENT

Yitzhak Hadani, 16 Keren Hayesod St., Romema, Haifa, Israel, assignor to Yitzhak Hadani, Haifa, Israel

Filed Oct. 29, 1981, Ser. No. 316,398
Claims priority, application Israel, Nov. 2, 1980, 61390
Int. Cl.³ G02B *23/02, 23/12;* H01J *31/50*
U.S. Cl. 250—213 VT **13 Claims**



1. A night-vision instrument comprising an ocular defining the axis of vision of the instrument along which light from the instrument enters the eye of a user; an input mirror; an objective lens and an image intensifier having a phosphor screen and a photocathode in spaced-apart relationship coaxial therewith; optical means to transfer the image appearing on said phosphor secreen onto the focal plane of said ocular; said objective lens and said image intensifier being positioned at a right angle to said axis of vision as it enters a user's eye, said input mirror being positioned with its optical center on said axis of vision at an angle of 45° to said axis of vision in such a manner as to reflect the image of the viewed object through the objective lens onto said photocathode of said image intensifier, the distance between the optical center of said input mirror and the pupil of the eye of a user equalling the distance between said mirror center and the optical center of said objective lens, and the optical means being so dimensioned as to cause the image to appear to the eye of a user at the same visual angle as if viewed from the same distance by the unaided eye.

4,467,191

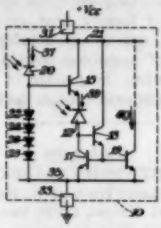
PHOTO DIODE WITH AUXILIARY PHOTO DIODE REGULATOR

Edward Chalfin, Shrewsbury, Mass., and Walter S. Gontowski, Jr., Thompson, Conn., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 339,032, Jan. 13, 1982,. This application Feb. 1, 1982, Ser. No. 344,449
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 A **6 Claims**

1. A photo sensor comprising a principal photo diode, a current mirror amplifier, an auxiliary photo diode, a string of series connected bias diodes, an emitter follower and a pair of DC supply busses, said auxiliary photo diode being connected from one of said busses in the reverse current polarity in series with said bias diodes string in the forward current polarity to the other of said busses, the input of said emitter follower being connected at a circuit point between said bias diodes string and

said auxiliary photo diode, said principal photo diode being connected in the reverse current polarity between the output



of said emitter follower and the input of said current mirror amplifier.

4,467,192

OPTICAL RECEIVER

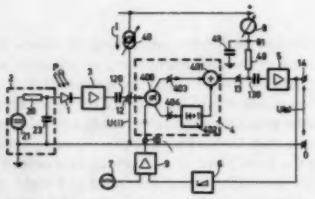
Henri J. Velo, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,704

Claims priority, application Netherlands, Feb. 26, 1981, 8100929

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—214 A **5 Claims**



1. An optical receiver comprising a photodiode connected to a biasing circuit, the photodiode being further connected to an output of the receiver via a series arrangement of a preamplifier, a control amplifier and an output amplifier, the output amplifier having an output connected via a detector to one input of a first differential amplifier, the first differential amplifier having another input connected to a first reference voltage source, the first differential amplifier also having an output connected to a control input of the control amplifier, characterized in that the control amplifier further comprises a current splitter having two outputs which are coupled to respective inputs of an adder circuit, that a signal input of the current splitter is connected to an adjustable direct current source and also to an output of the preamplifier via a first capacitor, that an output of the adder circuit is connected to an input of the output amplifier via a second capacitor and also to a first test point via a first resistor, and that the first test point is connected to a point of constant potential via a decoupling third capacitor.

4,467,193

PARABOLIC LIGHT EMITTER AND DETECTOR UNIT

Arthur B. Carroll, St. Joseph, Ill., assignor to Carroll Manufacturing Corporation, Champaign, Ill.

Filed Sep. 14, 1981, Ser. No. 302,201

Int. Cl.³ H01J *39/12*

U.S. Cl. 250—216 **7 Claims**

1. In a touch input device having a plurality of beams of light generated from individual light surfaces, and a plurality of photosensitive devices for responding to said beams, the combination comprising an elongated body of transparent material, a plurality of optoelectrical devices embedded in said material, said body having an external surface in the form of a plurality of paraboloids, said paraboloids being aligned with their axes

of symmetry in parallel, each of said paraboloids being aligned with one of the optoelectrical devices, a reflective coating on the exterior of each of said parabolic surfaces, and said body having a plane surface located on the opposite side of said optoelectrical devices from at least one of said paraboloid surfaces.

4,467,194

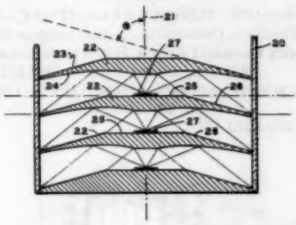
OMNIDIRECTIONAL ELECTRO-OPTICAL RECEIVER

Donald S. Foreman, Spring Lake Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 18, 1981, Ser. No. 303,435

Int. Cl.³ H01J *3/14*

U.S. Cl. 250—216 **8 Claims**



1. An omnidirectional optical system comprising, in combination:

a first reflector having a central portion and a convex surface which is a portion of a cone having a first axis;

a second reflector having a concave surface which is defined by rotation about said first axis of a portion of a parabola having its focus on said first axis and its axis oblique to said first axis;

means mounting said reflectors in spaced apposition so that light directed therebetween generally perpendicular to said first axis is reflected by said convex surface to said concave surface and by said concave surface to said central portion of said first reflector;

and a light responsive member mounted on said central portion of said first reflector.

4,467,195
INFORMATION DETECTING APPARATUS

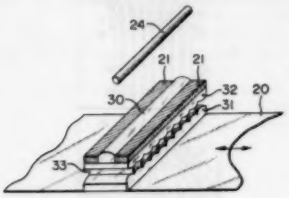
Naoto Kawamura, Inagi, and Kazuya Matsumoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 244,259, Mar. 16, 1981, abandoned, which is a continuation of Ser. No. 967,392, Dec. 7, 1978, abandoned. This application Feb. 7, 1983, Ser. No. 464,579

Claims priority, application Japan, Dec. 8, 1977, 52-147600; Dec. 8, 1977, 52-147601; Jul. 5, 1978, 53-81792; Dec. 2, 1978, 53-149204

Int. Cl.³ H01J *3/14*

U.S. Cl. 250—216 **19 Claims**



1. Information detecting apparatus comprising:
a linear light source;
a photoelectric sensor including a plurality of sensor elements arrayed in a predetermined major scanning direction;
a condensing optical system for condensing the light from said light source to illuminate a line on the surface of an original, said line being parallel to said major scanning direction;
at least one layer of cylindrical lens array system including a plurality of cylindrical lens elements arrayed in a directed parallel to said major scanning direction to provide a plurality of separate light paths, each of said cylindrical lens elements having a major axis extending in a direction perpendicular to said major scanning direction, said cylindrical lens array system forming on the surface of said photoelectric sensor array an erect equal magnification image of the illuminated line; and
driving means for producing relative movement between said photoelectric sensor and the original.

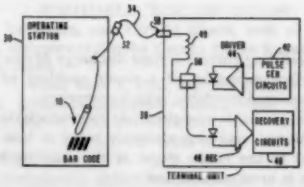
4,467,196
SINGLE FIBER OPTIC WAND SYSTEM

Layton Balliet, Boca Raton; Donald H. Coffman, and Carlos Gomez, both of Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1982, Ser. No. 393,258

Int. Cl.³ G06K *7/14*

U.S. Cl. 250—227 **10 Claims**



1. A fiber optic scanner system for reading coded patterns comprising:
a scanner housing;
a scanner tip forming one end of said housing adapted to be moved across a coded pattern;
a connector end located at the other end of said housing characterized by;
a single optical fiber transmission line located in said housing and having the reading end located in reading position within said scanner tip and the other end emerging from said connector end of said housing;
a remote terminal unit associated with the scanner;
a single optical fiber link connected between the scanner and said remote terminal unit;
an optical signal generator located in said remote terminal for producing and transmitting optical pulses of a given width and at a predetermined frequency through said single optical fiber link to said scanner and through said optical fiber transmission line in said housing to said scanner tip;
a receiver located in said remote terminal unit for receiving light pulses reflected from the coded pattern into the reading end of said single optical fiber transmission line located in said scanner tip;
and a light coupler located in said remote terminal unit for coupling reflected light pulses from said single optical fiber link into said receiver;
said optical signal generator pulse width and frequency and the bar code width and spacing being selected to produce the reflected light pulses between the generated light pulses thereby minimizing interference therebetween.

4,467,197
APPARATUS FOR MONITORING THE ACCELERATION ENERGY OF AN ELECTRON ACCELERATOR

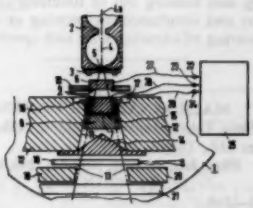
Volker Stieber, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,420

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138731

Int. Cl.³ H01J *1/52, 47/00*; G21K *1/10*

U.S. Cl. 250—305 **17 Claims**



1. In an apparatus for monitoring the acceleration energy of an electron accelerator, having a target to be exposed to a beam of accelerated electrons and an electron absorber positioned behind said target, the improvement wherein said electron absorber comprises a plurality of absorber portions which are insulated from each other, and a processing system, and wherein each of said absorber portions is electrically connected to an input of said processing system.

4,467,198
RADIATION SHIELDING ARRANGEMENT FOR COATING THICKNESS MEASUREMENT DEVICE

Boris B. Joffe, Buffalo; Jerry J. Spongr, and Boris N. Ivasyuk, both of Tonawanda, all of N.Y., assignors to Twin City International Inc., Amherst, N.Y.

Filed Sep. 22, 1981, Ser. No. 304,673

Int. Cl.³ G01N *23/203*

U.S. Cl. 250—308 **24 Claims**

15. A method of minimizing the exposure of an operator to stray radiation from a device for measuring thickness of a

coated part by means of sensing radiation backscatter, said method comprising:

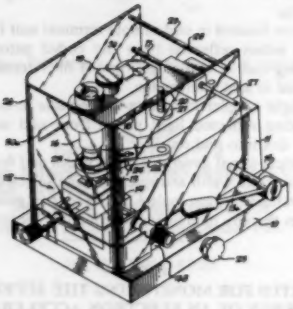
(a) providing an apertured housing containing a radiation source, said housing including a cover member overlying said aperture and providing a radiation shield;

(b) positioning said housing in a coating thickness measurement device including a base;

(c) elevating said housing with respect to said device to permit the removal therefrom of said cover member;

(d) interposing a second shield in covering relationship with the aperture in said housing;

(e) positioning a part in underlying relationship to said housing;



(f) slightly elevating said housing a distance sufficient to permit the lateral displacement of said second shield;

(g) laterally moving said second shield with respect to the axis of said housing a distance sufficient to clear said housing;

(h) causing said housing to move into contacting relationship with said part;

(i) determining the thickness of the coating on the part; and

(j) moving said housing out of touching relationship with said part and simultaneously moving said second shield into covering relationship with said aperture.

4,467,199

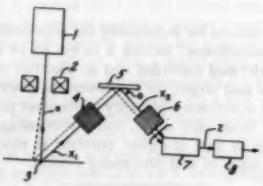
MACROANALYZER SYSTEM

Mitsuyoshi Sato, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 269,883

Int. Cl.³ G01N *23/22*

U.S. Cl. 250—310 **3 Claims**



1. A macroanalyzer comprising: an electron gun for emitting an electron beam; an electron lens positionsed for collimating the electron beam to a very small diameter which is small relative to the size of a target object to be analyzed and for scanning the collimated electron beam across a target object while maintaining the very small diameter of the beam; a flat diffraction crystal for diffracting secondary X-rays emitted from the target object as the electron beam is scanned thereacross; a first solar slit member positioned to collimate the secondary X-rays emitted from the target object before the secondary X-rays reach said diffraction crystal; a second solar slit member positioned to collimate X-rays diffracted from the diffraction crystal; the first and second solar slit members each comprising a plurality of stacked parallel plates with a slit formed between each two adjoining plates; an X-ray detector positioned to detect X-rays passed through said second solar slit member and to generate an output signal representative of the detected X-rays; and circuit means receptive of the X-ray detector output signal for discriminating between detected characteristic X-rays and a detected continuous X-ray spectrum and for dividing the respective discrimination X-ray values to eliminate X-ray intensity irregularities in the detected values of the characteristic X-rays caused by the X-rays passing through said solar slit members.

4,467,200

DEVICE FOR THE SURFACE TREATMENT OF THERMOPLASTIC MOLDINGS BY CORONA DISCHARGE

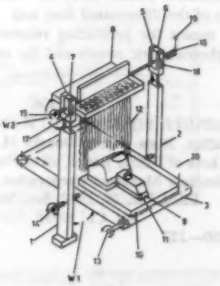
Klaus Kalwar, Alte Landwehr 10, 4803 Steinhagen-Amshausen; Egon Freytag, Halle-Kunsebeck; Lothar Hirschinger, Mannheim, and Klaus Ebner, Aglasterhausen, all of Fed. Rep. of Germany, assignors to Klaus Kalwar, Steinhagen-Amshausen and Firma Carl Freudenberg, Weinheim, both of, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,708

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045259

Int. Cl.³ H01T *19/04*

U.S. Cl. 250—324 **12 Claims**



1. An alternating current corona discharge device for altering the surface properties of a plastic molding so that the surface is rendered bondable, which comprises:

a movable, pivotable base electrode upon which the molding is positioned, said base electrode being at least partially adapted to the inside shape of the molding but being smaller in cross-section; and

a corresponding height adjustable and pivotable counter-electrode comprising a plurality of flexible, limp corona discharge units which do not exert a counter-force when flexed from their unflexed positions, are movably mounted in a holder, and are adaptable to the outline contours of the molding.

4,467,201

IMAGING DEVICES AND SYSTEMS

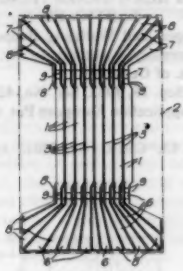
Anthony Blackburn, Southampton, and John B. Readhead, Lyndhurst, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,837

Claims priority, application United Kingdom, Mar. 30, 1981, 8109818

Int. Cl.³ H01J 31/49

U.S. Cl. 250—334 11 Claims



1. A thermal-radiation imaging device comprising:

a substrate;

a plurality of strips of semiconductor material in which free charge carriers can be generated on absorption of thermal radiation incident on the strips, said strips having lengths and widths and being arranged substantially parallel to each other on the substrate;

biasing electrode means for causing a bias current predominately of majority carriers to flow along the lengths of said strips, said bias current being capable of supporting an ambipolar drift of radiation-generated minority carriers in the opposite direction to the bias current; and

a plurality of readout means, each readout means reading out a signal representative of the ambipolar drift in one corresponding semiconductor strip, each readout means being arranged in the ambipolar drift path;

characterized in that;

each readout means comprises an electrically conductive connection element which protrudes from a first side of its corresponding strip at a readout area;

each semiconductor strip has a recess therein at the readout area, said recess extending across part of the width of the strip beginning from the side opposite to the side from which the connection element protrudes; and

the semiconductor strips are arranged on the substrate adjacent each other such that the connection elements protruding from the first sides of each strip extend into the recesses of adjacent strips.

4,467,202

PHOTOELECTRIC DETECTOR

Kenichi Nakamura, and Hiroshi Obara, both of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,397

Claims priority, application Japan, Mar. 4, 1981, 56-30165[U]; Mar. 4, 1981, 56-30166[U]

Int. Cl.³ G01J 1/00

U.S. Cl. 250—338 37 Claims

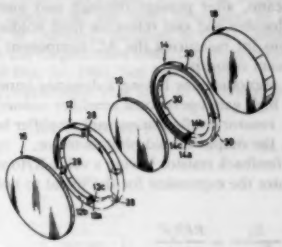
1. A photoelectric detector comprising:

a light-sensing element of a film of a pyroelectric polymer;

a first disturbance-preventive chamber and a second disturbance-preventive chamber, said first and second disturbance-preventive chambers being constructed so as to have a pressure equal to ambient pressure;

said light-sensing element being interposed between said first and second disturbance-preventive chambers, said light-sensing element comprising said pyroelectric polymer film and a first electrode and a second electrode disposed at both major surfaces thereof, and being fitted by a pair of rings comprising a first O-shaped ring and a second O-shaped ring;

said first O-shaped ring being connected to a protective plate



and said second O-shaped ring being connected to a backing member;

said first disturbance-preventive chamber comprising an enclosure formed by said light-sensing element, said first O-shaped ring and said protective plate; and

said second disturbance-preventive chamber comprising an enclosure formed by said backing member, said second O-shaped ring and said light-sensing element.

4,467,203

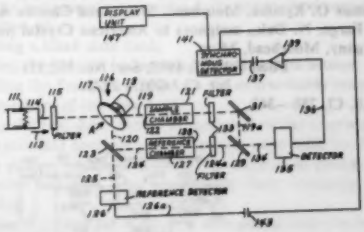
LOW NOISE AMPLIFIER AND METHOD FOR ENERGY BIASED RADIATION SENSITIVE RECEIVER

Andrew S. Rappaport, Belmont, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Oct. 19, 1981, Ser. No. 312,911

Int. Cl.³ G01N 21/27

U.S. Cl. 250—343 1 Claim



1. A photometric analysis apparatus for analyzing a fluid medium having at least one sample component having a characteristic absorption wavelength of interest, comprising:

a beam source of electromagnetic radiation including radiation at at least said one characteristic wavelength for providing a directed beam containing said characteristic wavelength,

beam modulation means in the path of said beam for providing first and second component beams whose intensities vary 180° out of phase at the rate of repetitive movement of said beam modulation means,

a sample fluid holding chamber having a first optical path passing therethrough,

said sample chamber being in the path of one of said first and second component beams for passing said one component through said sample chamber along the sample chamber optical path passing therethrough,

a reference fluid holding chamber having a second optical path passing therethrough,

said reference fluid chamber being in the path of the other of said first and second component beams for passing said other component beam through said reference chamber along the reference chamber optical path passing therethrough,

means for combining said first and second component beams, after passage through said sample fluid holding chamber and said reference fluid holding chamber, and

means for measuring the AC component of said combined beam comprising

a photodetector having a dynamic impedance Z,

a high gain operational amplifier connected in a feedback resistor configuration, said amplifier being connected to the output of said photodetector,

the feedback resistor having a value R_f to substantially maximize the expression for the signal to noise figure:

$$\frac{E_s}{E_{noise}} = \frac{RPR_fX}{(N)^{\frac{1}{2}}}$$

wherein R is the responsivity of the photodetector, P is the ambient energy incident on said photodetector, X is the modulation factor, and $(N)^{\frac{1}{2}}$ is the rms noise figure of the system where N is given by

$$N = \frac{R_f^2 4kT + E_a^2(Z + R_f)^2}{Z^2} + \frac{4kT[(Z + R_f)^2 + R_f^2]}{Z} + R_f^2(I_a^2 + 2ePR); \text{ and}$$

E_a and I_a are respectively the voltage and current input noise figures for the operational amplifier, k is Boltzman's constant, T is the operating temperature of the photodetector, and e is the electronic charge.

4,467,204

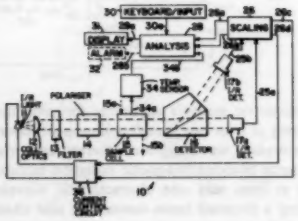
APPARATUS AND METHOD FOR MEASURING OPTICALLY ACTIVE MATERIALS

James O. Kysilka, Moorhead, Minn., and Charles A. Sawicki, Fargo, N. Dak., assignors to American Crystal Sugar Company, Moorhead, Minn.

Filed Feb. 25, 1982, Ser. No. 352,321

Int. Cl.³ G01N *21/21*

U.S. Cl. 250—343 **20 Claims**



1. A polarimeter system for sensing optical rotation caused by optically active material in a dark sugar solution, said polarimeter system comprising:

(a) means for containing a liquid sample of optically active material in the dark sugar solution;

(b) an infrared light source for emitting infrared light;

(c) polarizer means operatively connected to intercept at least a portion of said infrared light for producing a polarized light beam therefrom;

(d) means for directing said polarized light beam through at least a portion of said liquid sample; and

(e) infrared light detection means operatively connected to intercept said light beam after passing through said liquid sample, for producing a signal in response to the rotational condition of said polarized light beam, whereby the optical rotation caused by the dark sugar solution may be determined.

4,467,205

HIGHLY-STEADY BEAM GENERATING FOR CHARGED PARTICLES

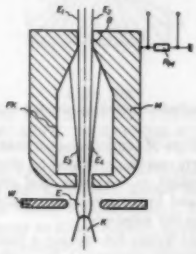
Siegfried Beisswenger, and Wolfgang Boppel, both of Preetz, Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hill GmbH, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,311

Claims priority, application European Pat. Off., Oct. 21, 1981, 81 108624

Int. Cl.³ G01K *1/00*; H01J *3/00*

U.S. Cl. 250—397 **5 Claims**



1. In an electron beam generating system which comprises a heated cathode for generating an electron beam an auxiliary electrode and a transpierced anode, the improvement comprising:

a diaphragm structure surrounding the electron beam at the side of the auxiliary electrode which is opposite to the cathode; a precision resistor connected to said diaphragm structure for developing a voltage drop in response to a portion of the electron beam striking said diaphragm structure,

a voltage regulator connected to a reference voltage and connected to said precision resistor for developing a control voltage; and

a control element connected between said voltage regulator and the auxiliary electrode for applying a control potential to the auxiliary electrode in response to the control voltage as a correction measure of that portion of the electron beam striking said diaphragm structure.

4,467,206

METHOD AND APPARATUS FOR THE IRRADIATION OF FLUIDS

John A. Taylor, Furlong, and Richard F. Conyne, Rushland, both of Pa., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Dec. 14, 1981, Ser. No. 330,535

Int. Cl.³ G01N *21/00*

U.S. Cl. 250—435 **56 Claims**

1. A device for irradiating a fluid contained therein or flowing therethrough, said device comprising:

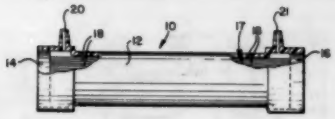
a hollow casing having a first end wall and a second end wall,

an inlet in said casing between said first end wall and said second end wall for introducing said fluid into the interior of said casing,

an outlet in said casing between said first end wall and said

second end wall for withdrawing said fluid from the interior of said casing,

at least one radiant energy transmitting element having a first end portion and a second end portion being disposed within said casing, said radiant energy transmitting element being adapted to transmit radiant energy to the interior of said casing from a radiant energy source located externally of said device and to emit radiant energy in the interior of said casing when contacted by said fluid, the first end portion of said element being secured in said first end wall, the outer peripheral surface of said end portion of said element which is secured in said end wall being contacted by a material whose refractive index is equal to or less than the refractive index of said element.



4,467,207

NON-MIGRATING CONTROL INDICIA FOR A PLASTIC WEB OR SHEET ARTICLE

Hershey Lerner, Hudson, Ohio, and Harold Waltz, Berkeley, Calif., assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 166,499, Jul. 7, 1980, abandoned. This application Jul. 1, 1982, Ser. No. 394,121

Int. Cl.³ G01N *21/38*

U.S. Cl. 250—459.1 12 Claims

1. A method for controlling operations to an article of manufacture comprising the steps of:

(a) affixing an essentially non-migrating mark of organic ionic or polar material to a heat-sealable polyolefin plastic foil, which mark responds to incident electromagnetic radiation by emitting electromagnetic radiation of a different wavelength;

(b) detecting the presence of said mark by sensing the presence of said emitted electromagnetic radiation; and

(c) performing operations to said foil in response to the detection of said mark.

4,467,208

RADIATION SENSOR CONTAINING FLUORESCIBLE MATERIAL

Gerhard Müller, and Albert Kreuttner, both of Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, d/b/a Carl Zeiss, Oberkochen, Oberkochen, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,711

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119570

Int. Cl.³ G01J *5/08*

U.S. Cl. 250—483.1 9 Claims

1. A radiation sensor containing fluorescent material in which the radiation to be detected is absorbed and the fluorescent light produced is conducted onto the photosensitive surface of a detector, characterized by the fact that the sensor consists of a collector in the form of at least one optical fiber having first and second ends arranged in the form of a surface of a regular shape, the optical fibers having a cladding of material which is transparent to the radiation to be detected and a core which contains the fluorescent material, and at least one detector for the fluorescent radiation, said detector being connected to at least one of the ends of the optical fibers.

8. A radiation sensor in accordance with claim 1, characterized by its use for transmitting radiation between parts which are moved relative to each other, one of the two moving parts including a source of radiation while the sensor is arranged on the other part so that a part of the collector is always struck by the radiation.

4,467,209

METHOD OF PRODUCING IDENTIFICATION CARDS AND A DEVICE FOR CARRYING OUT SAME

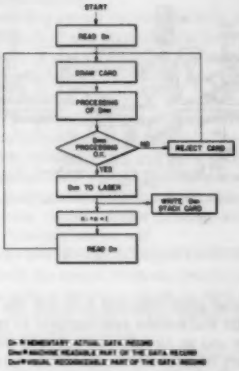
Thomas Maurer; Erwin Lob, and Peter Schweiger, all of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,188

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049607

Int. Cl.³ G06K *3/02*

U.S. Cl. 235—487 16 Claims



1. A method for recording data from a data source on a blank data card, the data having a first portion to be erasably recorded, and a second portion to be permanently recorded the card having at least one overwritable recording medium and a medium for permanently recording data, said method comprising the steps of:

providing a blank data card;

obtaining the data to be recorded from the data source;

recording the first data portion on the overwritable recording medium of the data card;

reading the first data portion as recorded on the overwritable recording medium and comparing same with the first data portion obtained from the data source to determine whether the first data portion has been correctly recorded;

rejecting the data card if the first data portion has not been correctly entered; and

recording the second data portion on the permanent recording medium of the data card if the first data portion has been correctly entered.

4,467,210

ELECTRON-BEAM IMAGE TRANSFER DEVICE

Kazuyoshi Sugihara, Yokohama; Toru Tojo, Yamato; Ichiro Mori, Tokyo, and Toshiaki Shinozaki, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 18, 1982, Ser. No. 379,712

Claims priority, application Japan, May 26, 1982, 56-79563

Int. Cl.³ H21J *37/00*

U.S. Cl. 250—492.2 6 Claims

1. An electron-beam image transfer device for transferring a pattern on a photoelectric mask onto a specimen comprising:

an evacuated vessel having a main chamber;

U.V. source means placed outside of said main chamber for providing U.V. rays;

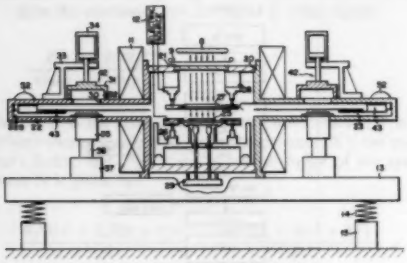
guiding means coupled to said evacuated vessel for guiding said U.V. rays from said U.V. source means into said main chamber;

a specimen holder disposed in said main chamber to hold said specimen detachably in fixed position;

a mask holder disposed in said main chamber to hold said photoelectric mask detachably in fixed position in facing relation to said specimen;

means to impress a magnetic field and an electric field to said specimen and photoelectric mask in the direction in which they face each other;

first and second subchambers disposed in the proximity of said evacuated vessel to house the specimen and photoelectric mask, respectively;



first and second gates disposed between the main chamber and the first and second subchambers to enable selective connection and an airtight seal between them;

a first auxiliary transferring mechanism to transfer the specimen from said first subchamber into the main chamber through said first gate;

a second auxiliary transferring mechanism to transfer the photoelectric mask from said second subchamber into the main chamber through the second gate;

a main transferring mechanism to transfer the specimen and photoelectric mask, which have been brought into the main chamber, onto said specimen holder and mask holder; and

an evacuating means to evacuate said main chamber and subchambers.

4,467,211

METHOD AND APPARATUS FOR EXPOSING MULTI-LEVEL REGISTERED PATTERNS INTERCHANGEABLY BETWEEN STATIONS OF A MULTI-STATION ELECTRON-BEAM ARRAY LITHOGRAPHY (EBAL) SYSTEM

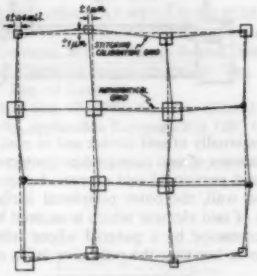
Donald O. Smith, Lexington, and Kenneth J. Harte, Carlisle, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 254,870, Apr. 16, 1981,. This application May 23, 1983, Ser. No. 496,902

Int. Cl.³ G03F *9/00*

U.S. Cl. 250—492.2 **26 Claims**

1. The method of operating an electron beam array lithography system employing an electron beam column of the array optics type having an array lenslet assembly, an array fine deflector assembly and a coarse deflector assembly for selectively directing an electron beam to a desired element of the array of lenslet and its associated fine deflector element which directs the electron beam to a desired point on a target surface; the method comprising fabricating a lenslet stitching calibration grid having formed thereon a grid-like network of fiducial marking elements, using said calibration grid to derive fiducial marking signals indicative of the boundaries of the field of view of the individual elements of the array lenslet assembly, mapping the lenslet stitching calibration grid to a computer ideal mathematic grid standard by measuring the x-y coordinate position of the fiducial marking elements after precisely locating the positions of the centers of the fiducial marking elements, deriving from the measurements the deviations between the positions of each lenslet stitching calibration grid fiducial marking element and its corresponding location on the computer ideal mathematical grid, and utilizing the deviations



in the measurements to modify the control signals employed in controlling x-y deflection of the electron beam column to correct for the deviations in the lenslet stitching calibration grid from the ideal mathematical grid to thereby stitch together the individual fields of view of the elements in the array lenslet assembly in order to cover a desired area of a target workpiece to be exposed to the electron beam and which is greater in surface area than the area covered by the field of view of an individual array lenslet element.

4,467,212

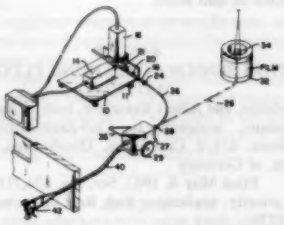
RADIOACTIVE SOURCE PIGTAIL INSPECTION APPARATUS AND METHOD

Donald J. Olcott, 1107 S. Walnut St., Burlington, Wash. 98233

Filed May 11, 1981, Ser. No. 262,044

Int. Cl.³ H04N *7/18*; G21F *5/02*

U.S. Cl. 250—497.1 **6 Claims**



4. An apparatus for safely inspecting a radioactive pigtail, comprising;

(a) an exposure device including a shielded container for holding the pigtail when the pigtail is not being used to radiograph;

(b) a conduit connected to the container;

(c) means for moving the pigtail in the conduit, the means being actuatable from a remote location;

(d) an inspection tube attached to the conduit, the tube having a longitudinal axis;

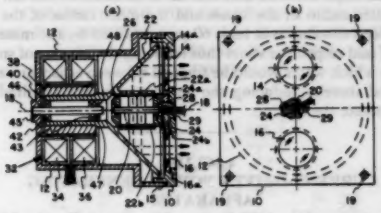
(e) at least two television cameras mounted orthogonal to each other and to the longitudinal axis of the tube; and

(f) means operatively associated with the cameras for viewing the pigtail within the tube at the remote location.

4,467,213
SOURCE ASSEMBLY FOR GAS ANALYSIS INSTRUMENTS

Carl A. Farren, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 28, 1982, Ser. No. 392,841
Int. Cl.³ G01J 1/00
U.S. Cl. 250—504 R 23 Claims



1. An improved source assembly for generating chopped infrared radiation for application to the cells of a gas analysis instrument comprising:

(a) a generally conical reflector having a reflective inner surface;

(b) drive means for rotating the reflector;

(c) an infrared source positioned within the reflector for illuminating the reflective surface;

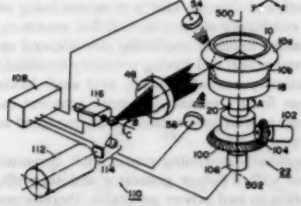
(d) channeling means positioned between the source and the reflector for insulating the source and for channeling infrared radiation toward the reflective surface in at least one direction that is generally perpendicular to the axis of rotation of the reflector; and

(e) means for interrupting the reflection of infrared radiation from the reflective surface when the reflector is in predetermined angular positions.

4,467,214
METHOD OF AND APPARATUS FOR DETECTING EXTERNAL DEFECTS OF A CIRCULAR SEALING MEMBER

Hiroshi Ito, Nagoya; Hiroshi Kuno, Toyota, and Tooru Kai, Inazawa, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyoda Gosei Co., Ltd., both of Aichi, Japan

Filed Jun. 10, 1981, Ser. No. 272,360
Claims priority, application Japan, Jun. 13, 1980, 55-79835
Int. Cl.³ G01N 21/88
U.S. Cl. 250—563 14 Claims



1. Apparatus for detecting an external defect of a circular member comprising:

a rotary stand rotatably mounted on a detecting table and placed thereon with the circular member to be rotated;

an automatic delivery mechanism for delivering circular members to be inspected one after another to said rotary stand in a predetermined posture;

a scanning light source for irradiating the detecting rays, which are controlled and scanned at a speed faster than the rotating speed of said rotary stand substantially in parallel with a rotary axis of said rotary stand, to a conical surface of the circular member, said scanning light source comprising:

a laser radiating a directional beam;

a light deflector having a deflecting axis provided perpendicularly to the rotary axis of the rotary stand, and polarizing and scanning said laser; and

a projector lens projecting the deflected light sectorially scanned to conical surfaces as parallel rays; and

a photoelectric detector for receiving the regularly reflected light from the conical surface to convert same into electric signals;

a defect detecting circuit for continuously processing said electric signals of said photoelectric detector at least per full rotation of said rotary stand and detecting a surface defect of said circular member, said defect detecting circuit comprising:

a delay circuit delaying output of the photoelectric detectors for a certain period of time;

an attenuator attenuating an output of said delay circuit;

an adder adding a bias voltage to an output of said attenuator and feeding a floating threshold value;

a sample hold circuit sample holding and feeding the floating threshold value; and

a comparator comparing the output from said sample hold circuit with the output from the photoelectric detector to feed a defect detecting signal as well as holding the floating threshold value of said sample hold circuit by the defect detecting signal;

whereby said threshold value is adjusted to the most suitable value in accordance with the fluctuation of the reflected light; and

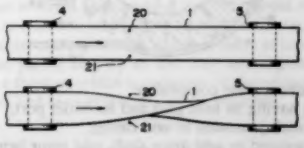
a selecting mechanism for selecting non-deflecting circular members from the defective ones upon completion of inspection in response to the defect detecting signals of said defect detecting circuit;

so that the surface defects can be optically inspected without touching the circular members.

4,467,215
TAPE SURFACE DISCRIMINATING SYSTEM

Toshihiro Kato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 16, 1981, Ser. No. 331,349
Claims priority, application Japan, Feb. 24, 1981, 56-25034
Int. Cl.³ G01B 11/04
U.S. Cl. 250—571 8 Claims

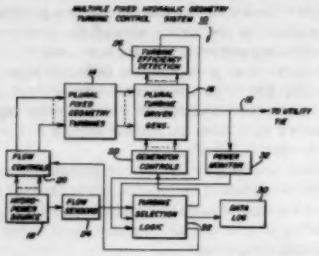


1. A system for discriminating between the front and back surfaces of a tape having a given width comprising; first means for discriminating the front and back surfaces of a tape at least at one end thereof, and second means for detecting any section of the tape twisted at intermediate sections of the moving tape on the basis of a change in an actual width of the tape created when said tape twists such that its actual width is different from said given width.

4,467,216
MULTIPLE FIXED HYDRAULIC GEOMETRY TURBINE CONTROL SYSTEM

Robert E. Murphy, Boise, Id., assignor to J-U-B Engineers, Inc., Boise, Id.

Filed Apr. 6, 1982, Ser. No. 365,971
Int. Cl.³ H02P 9/04
U.S. Cl. 290—43 **10 Claims**

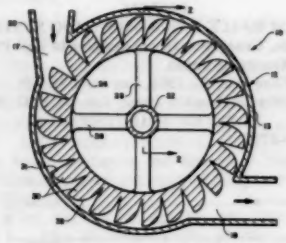


1. A method of generating energy from a variable flow hydropower source by operating in parallel a plurality of fixed hydraulic geometry turbines respectively driving electric generators connected to a common output bus, including the steps of: monitoring flow from the hydropower source to detect substantial deviation from a maximum available flow adapted to drive all of the turbines at substantially the respective rated efficiencies thereof; selecting the turbines through which flow from the hydropower source is interrupted when said deviation occurs to substantially match the monitored flow with uninterrupted flow through the remaining turbines operating with acceptable deviation from the respective rated efficiencies thereof; and enabling only the generators driven by the operating turbines.

4,467,217
HYDRO-TURBINE

Ernest H. Roussey, 5577 Grape St., San Diego, Calif. 92105

Filed May 17, 1982, Ser. No. 379,076
Int. Cl.³ F03B 7/00
U.S. Cl. 290—54 **4 Claims**

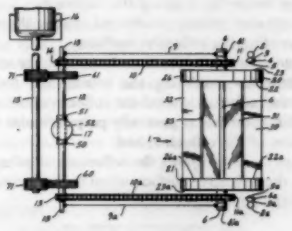


1. A hydro-turbine comprising:
a casing having an inlet port and an outlet port;
a drive shaft journaled in said casing;
a rotor secured to said drive shaft, said rotor being formed from a cylindrical member whose inner radius is at least greater than 50 percent of the outer radius of said rotor, a plurality of spokes extending inwardly from the inner radius surface of said cylindrical member, the inner ends of said spokes being structurally secured to said drive shaft so that said rotor and said drive shaft rotate as a single unit; and
a plurality of vane members extending outwardly from the outer radial surface of cylindrical member, said vanes being spaced around the perimeter of said cylindrical member, said vanes having a front surface and a rear surface, said front surface being substantially flat and said rear surface being convex in cross-section, the bottom edge of the rear surface of each vane is located substantially adjacent the bottom edge of the front surface of the adjacent vane member whereby the area defined from the front flat surface of one vane to the flat front surface of the next adjacent vane and also the area defined between the outer radius of the vanes and the inner radius of the respective vanes is at least 60 percent filled by the material of said respective vanes thus reducing the amount of space in which water would be trapped between adjacent vanes and thereby reducing the amount of water required to operate the turbine.

4,467,218
CURRENT-DRIVEN POWER GENERATING APPARATUS

Walter Andruszkiw, 6287-Capitan SE., Grand Rapids, Mich. 49506, and Roman W. Andrushkiw, 42400 Malbeck, Sterling Heights, Mich. 48078

Filed Sep. 30, 1982, Ser. No. 429,121
Int. Cl.³ F03B 7/00; E02B 9/04
U.S. Cl. 290—54 **5 Claims**



1. A current-driven power generating apparatus comprising:
(i) a water-wheel disposed in a flowing current of water and revolving about its longitudinal axis due to the action of said current comprised of;
(a) a longitudinally extending central axle having fixedly mounted thereon a plurality of generally rectangular paddles extending radially and longitudinally thereof, said paddles having a flat surface and being acted upon by the flowing current thereby revolving said central axle;
(b) hollow disc members mounted fixedly on said axle adjacent each end thereof, said disc members forming the circular side walls of said water wheel;
(c) gear means fixedly mounted on said central axle adjacent each end thereof, said gear means being disposed axially outwardly relative to said disc members;
(ii) a vertically extending anchoring post located upstream of said water wheel and having rotatably mounted therein a longitudinally extending shaft, said shaft having first gear means fixedly mounted thereon adjacent each end thereof, and second gear means fixedly mounted adjacent said first gear means;
(iii) a longitudinally extending power shaft communicating at one end with a power generator and supplying rotational motion to said power generator, thereby powering said generator, and having fixedly mounted adjacent the other end thereof two gear means, said gear means being in contact with, meshing with, and being driven by said second gear means of said longitudinally extending shaft rotatably mounted in said anchoring post; and
(iv) Rotation transmitting means connecting said gear means fixedly mounted on said central axle and said first gear

means fixedly mounted on said longitudinally extending shaft, whereby rotation of said axle is transmitted via said transmitting means to said longitudinally extending shaft, thereby causing rotation of said longitudinally extending shaft.

4,467,219

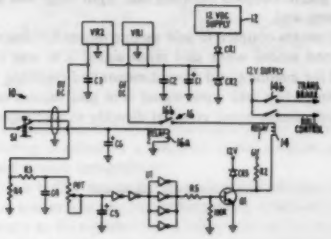
VARIABLE TIME DELAY APPARATUS FOR CONTROLLING THE START OF A VEHICLE

Dennis Reid, 1558 First Ave., Walnut Creek, Calif. 94596

Filed Jun. 7, 1982, Ser. No. 385,542

Int. Cl.³ H01H *43/04*

U.S. Cl. 307—10 R 11 Claims



1. A variable time-delay circuit for controlling the start of a vehicle after a preset period of delay wherein said vehicle is started by engaging the engine of said vehicle and braking means to hold said vehicle, then disengaging said braking means after said period of delay, said apparatus, having electrical power supplied thereto, comprising:

relay means for selectively engaging and disengaging said braking means;

adjustable time delay means for setting said period of delay;

switch means for selectively causing said relay means to engage said brake means and to disengage said brake means after said period of delay; and

safety activation means preventing said relay means from engaging said braking means in the absence of said switch means selected to cause said relay means to engage said brake means.

4,467,220

POWER SWITCHING APPARATUS

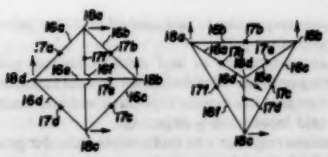
Ronald Page, 3750 Edgemont Blvd., Vancouver, B.C., Canada V7R 2P8

Continuation-in-part of Ser. No. 314,862, Oct. 26, 1887, abandoned, which is a continuation-in-part of Ser. No. 218,480, Dec. 22, 1980, abandoned, which is a continuation of Ser. No. 878,310, Feb. 16, 1978, Pat. No. 4,247,787. This application Mar. 25, 1983, Ser. No. 477,591

The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.

Int. Cl.³ H02B *1/24*; H02J *4/00*

U.S. Cl. 307—19 26 Claims



1. A distributed switching network comprising a plurality of remotely located sources/loads, six conducting branches extending between said remotely located sources/loads, each of said branches of said switching network comprising means for conducting direct current, single phase alternating current or polyphase alternating current as required by the application thereof, each of said branches containing at least one switching means, said branches being connected at their ends to form four 3-sided rings, each of said branches forming one side of and being shared by two of the said rings, whereby four triple-connected nodes are formed at the end connction points of the said branches, each of said nodes enabling a connection of one of said remote sources/loads and each of said nodes being isolatable from all of the other said nodes by an opening of a maximum of three of said switching means, including an additional switching means in at least one of the said branches to provide a double-connected source/load connection point or a node between the said additional switching means and said one switching means in said one branch, the said double-connected point being isolatable from the remainder of said network by an opening of the said additional switching means and said one switching means in said one branch.

4,467,221

SWITCHING NETWORK PARTICULARLY FOR HIGH VOLTAGE SUPPLY SYSTEMS

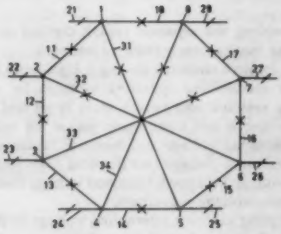
Georg Köppl, Birr, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 27, 1982, Ser. No. 412,245

Claims priority, application Switzerland, Sep. 30, 1981, 6295/81

Int. Cl.³ H02B *1/24*

U.S. Cl. 307—112 5 Claims



1. A switching network having at least four nodes connected to each other via interruptable current branches wherein at least two nodes can be connected by closing a first set of the current branches to form a first partial ring and at least two other nodes can be connected by closing a second set of the current branches to form a second partial ring wherein all of the nodes and current branches contained in each of said first and second partial rings are mutually exclusive of the nodes and current branches, respectively, of the other partial ring, and further wherein each node of the first partial ring is connected to at least one node of the second partial ring and each node of the second partial ring is connected to at least one node of the first partial ring by at least one interruptable current branch in a third set which is exclusive of the current branches in said first and second sets of current branches.

4,467,222

TIMER WITH TOUCH CONTROL

Thomas A. O. Gross, Lincoln; Edward Lalumiere, Woburn, and William A. Arzberger, Medfield, all of Mass., assignors to Jet Spray Corp., Norwood, Mass.

Continuation of Ser. No. 155,450, Jun. 2, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,267

Int. Cl.³ H01H *43/00*

U.S. Cl. 307—115 15 Claims

1. A touch control system for operating a timer having a

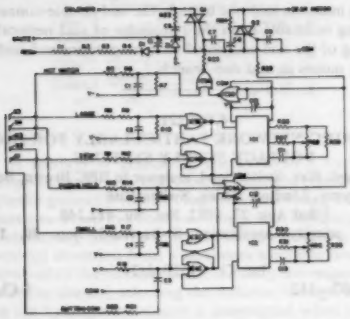
plurality of different control-inputs and operated from an alternating voltage source, comprising:

logic control circuitry including a plurality of logic control circuits respectively coupled to each control input of the timer for controlling the operation thereof;

a plurality of resistive networks each having an input, an output, at least one series resistor of large value for the purpose of limiting fault currents and an operating voltage terminal,

a switch array including a plurality of contact touch switches each having open and closed positions and including separate switch contacts and a common contact which is common to all switches,

means coupling the output of each resistive network to the corresponding logic control circuit,



means coupling the separate switch contact to the corresponding input of each resistive network,

said logic control circuitry having a high input impedance,

means for establishing operating voltages for at least the resistive network and switch array from said alternating voltage source and comprising means for establishing a first alternating voltage and means for establishing a second alternating voltage that deviates from said first alternating voltage by a predetermined voltage throughout the alternating voltage waveform,

means coupling said first alternating voltage to the common contact of all switches of the switch array,

and means coupling said second alternating voltage to the operating voltage terminal of the resistive network.

4,467,223

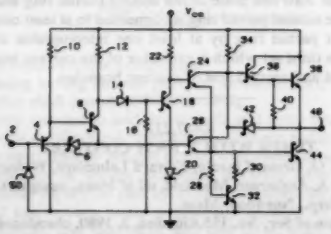
ENABLE GATE FOR 3 STATE CIRCUITS

Eric D. Neely, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 22, 1982, Ser. No. 370,706

Int. Cl.³ H03K *17/60, 19/088*

U.S. Cl. 307—254 **10 Claims**



1. A circuit for providing an enabling signal at an output thereof when an input signal is in a first state and for providing a disabling signal at said output when said input signal is in a second state, comprising:

first means for supplying current to said output when said input signal is in said first state to produce said enabling signal;

second means for sinking current from said output when said input signal is in said second state to produce said disabling signal;

an input stage for receiving said input signal;

third means coupled to said first means for enabling said first means when said input signal is in said first state and for disabling said first means and enabling said second means when said input signal is in said second state;

delay means coupled between said input stage and said third means; and

fourth means coupled to said second means for disabling said second means when said input signal is in said first state and for enabling said second means and disabling said first means when said input signal is in said second state, said fourth means being coupled directly to said input stage.

4,467,224

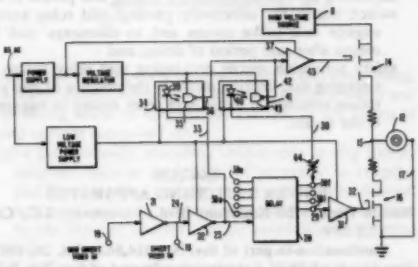
SYSTEM FOR APPLYING A HIGH VOLTAGE SOURCE TO A CRT THROUGH A CAPACITIVE LOAD

William J. Maddox, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,611

Int. Cl.³ H03K *17/687, 3/26*

U.S. Cl. 307—270 **9 Claims**



1. A system for applying a high voltage pulse to a CRT through a high capacitance load comprising

p-type electron control means and n-type electron control means for alternatley coupling said load to said high voltage source when one type of said electron control means is conductive;

means for receiving an input pulse and providing a control pulse;

delay means responsive to said control pulse for providing a delayed control pulse;

first means responsive to said delayed control pulse for rendering one type of said electron control means conductive when said input pulse is positive and non-conductive when said input pulse is negative;

second means responsive to said control pulse for providing a stretched control pulse; and

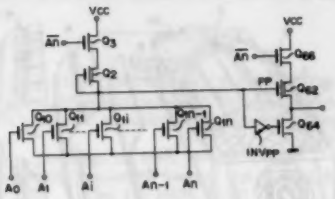
third means responsive to said stretched control pulse for rendering the other type of electron control means conductive when said one type is nonconductive and nonconductive when said one type is conductive.

4,467,225

ADDRESS SELECTION DEVICE

Sumio Tanaka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1980, Ser. No. 183,814
Claims priority, application Japan, Sep. 10, 1979, 54-115879
Int. Cl.³ H03K 3/01, 17/687, 19/094
U.S. Cl. 307—296 A 4 Claims



1. An address selection device having a power source terminal and being coupled to a multi-bit signal address selection signal, said device comprising:

(a) address buffer means for receiving said address selection signal and producing output bit signals which are complementary to bit signals of said address selection signal; and

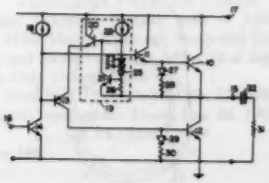
(b) decoder circuit means for decoding said address selection signal which includes a plurality of MOS transistors connected in parallel with one another and receiving respectively at their gates corresponding bit signals of said address selection signal, constant current load means connected in series with said plurality of parallel-connected MOS transistors, and a plurality of MOS transistors being connected in series between said load means and said power source terminal, each of said plurality of series-connected MOS transistors receiving at its individual gate a different specified one of said complementary bit signals from said address buffer means.

4,467,226

DARLINGTON COMPLEMENTARY CIRCUIT FOR PREVENTING ZERO CROSSOVER DISTORTION

Shigeru Nagasawa, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 31, 1981, Ser. No. 288,797
Claims priority, application Japan, Sep. 5, 1980, 55-122997
Int. Cl.³ H03K 3/26, 17/60
U.S. Cl. 307—315 3 Claims



1. A Darlington complementary circuit comprising:

a. a pre-driver transistor providing an output signal;

b. an output terminal;

c. first and second complementary Darlington pairs, said pairs coupled in parallel between the output of said pre-driver transistor and said output terminal, said pairs each comprising an input transistor and an output transistor, said pairs being connected to said pre-driver transistor with said first pair being conductive when said output signal from said pre-driver transistor exceeds a turn-on level and said second pair being conductive when said output signal from said pre-driver transistor is less than said turn-on level; and

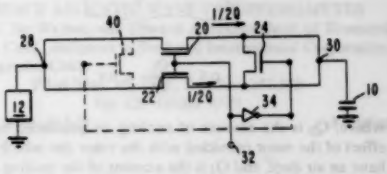
d. means for maintaining the impedance of said first and second Darlington pairs constant during cross-over of said turn-on level by said output signal including means for turning off said input transistor of each pair immediately upon turn-off of said output transistor of that pair.

4,467,227

CHANNEL CHARGE COMPENSATION SWITCH WITH FIRST ORDER PROCESS INDEPENDENCE

Lanny L. Lewyn, Palo Alto, and Charles H. Lucas, Newport Beach, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 29, 1981, Ser. No. 316,175
Int. Cl.³ H03K 17/687, 17/16
U.S. Cl. 307—577 12 Claims



12. A precision semiconductor switch comprising:

an input node and an output node;

a pair of field effect transistors connected in parallel, the source/drain current paths of the switching transistors being connected between said input and output nodes as a switch across said nodes;

a compensating field effect transistor having its source and drain both connected together and to either said input or output node; and

means for applying a control signal to the gates of said transistor pair and means for applying the logical compliment of said control signal to the gate of said compensating transistor.

4,467,228

Patent Not Issued For This Number

4,467,229

ELECTRIC ROTARY MACHINERY OF SALIENT-POLE TYPE

Tadahisa Ogita, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 21, 1982, Ser. No. 400,587
Claims priority, application Japan, Aug. 14, 1981, 56-126630
Int. Cl.³ H02K 9/04
U.S. Cl. 310—60 A 4 Claims

1. An electric rotary machinery of the salient-pole type, comprising:

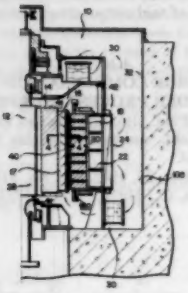
a rotor including a rotor rim which does not have an air duct, and salient magnetic poles spaced from each other and mounted on an outer periphery of the rotor rim, wherein a fan effect of said magnetic poles axially drives air in said spaces and causes radial flow of air;

a stator arranged to enclose said rotor and provided with radially arranged stator air ducts;

an air circulating passage including said spaces between said magnetic poles, said stator air ducts and an outer circumferential air flowing passage formed around the outer circumference of said stator;

electric fan means for driving air to circulate through said air circulating passage; and

limiting members attached to said rotor to limit the fan effect of said magnetic poles, said limiting members being mounted to meet the relationship:



$$0.3 < \frac{Q_3}{Q_0} < 0.9$$

where, Q_0 is the amount of cooling air produced by the fan effect of the rotor provided with the rotor rim which does not have an air duct, and Q_3 is the amount of the cooling air in the case where the limiting members have been mounted, and said electric fan means having a capacity large enough to make up for the decreased amount of the cooling air caused by the limiting members.

4,467,230

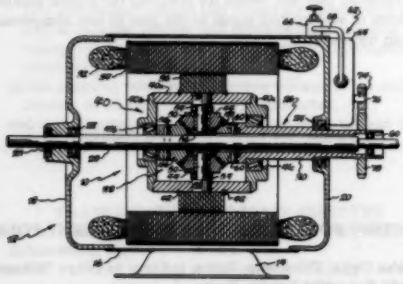
ALTERNATING CURRENT MOTOR SPEED CONTROL

Robert S. Rovinsky, 1 Nimitz Ct., Tonawanda, N.Y. 14150

Filed Nov. 4, 1982, Ser. No. 439,032

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—83 **20 Claims**



1. A motor speed control in combination with a motor having a rotor disposed entirely within a stationary motor housing, the rotor, during operation of the motor, being normally driven at a relatively constant speed; said control being characterized by

a gear assembly disposed within said rotor, said gear assembly including input gearing rotatable with said rotor, output gearing, and regulating gearing operatively associated with said input and output gearing;

shaft means including an output shaft coupled to said output gearing, and a control shaft coupled to said regulating gearing, said shaft means supporting said gear assembly;

bearing means carried by said motor housing, the shaft means being journaled within said bearing means; and

controller means interconnected with the control shaft and capable of controlling the speed of the regulating gearing whereby the speed of the output shaft may be varied.

4,467,231

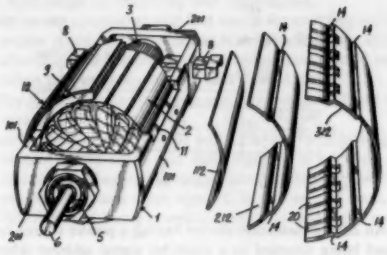
PERMANENT-MAGNET D.C. ELECTRIC MOTOR WITH RESILIENT STATOR YOKE

Renato Biglino, Genoa, Italy, assignor to Polymotor Italiana S.p.A., Italy

Filed Oct. 20, 1982, Ser. No. 435,434

Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **15 Claims**



1. A d.c. electric motor in which the fixed magnetic field is produced by permanent magnets, comprising a rotor having a coaxial armature and commutator, the commutator having windings and being in frictional contact with brushes carried by brush holders mounted on a stator, the stator having an elongated frame including at least two longitudinal rigid members equally spaced apart from and substantially parallel to the motor axis, and having a yoke external to and surrounding at least a portion of the frame, the yoke comprising first and second sections of resilient ferromagnetic material, said yoke sections resiliently holding said permanent magnets in position around said rotor and forming a magnetic path for the field of said magnets.

4,467,232

DIRECT-CURRENT MACHINE

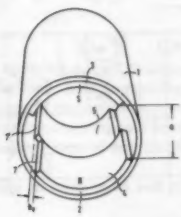
Winfried Eichhorn, Tamm, and Kurt Eclercy, Landshut, both of Fed. Rep. of Germany, assignors to International Standard Electrik Corporation, New York, N.Y.

Filed May 9, 1983, Ser. No. 492,921

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218239

Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **5 Claims**



1. A fixed stator structure for a direct-current machine having permanent-magnet field stator elements, comprising:

a generally cylindrical stator frame;

first means comprising a first plurality of equal sized, generally annular, cylindrical permanent-magnet segments arranged to form a first group of permanent-magnet stator members, said first plurality of stator members being arranged in axial juxtaposition and offset circumferentially with respect to each other by an amount small compared to the diameter of said cylindrical stator frame;

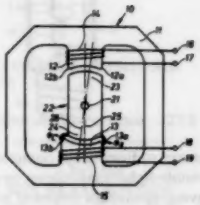
second means comprising a second plurality of cylindrical permanent-magnet segments offset and arranged as in said first means, said second means segments being fixed in said stator frame diametrically opposite said first means segments, said offsets of each of said first and second pluralities of segments being arranged to provide a substantially constant circumferential clearance between said segments of said first and second pluralities of segments, the amount of said clearance being greater than the amount of said offset, but small compared to the diameter of said stator frame.

4,467,233

SELF STARTING RELUCTANCE MOTOR

Lars G. Morén, Huddinge, and Ulf P. Berg, Hägersten, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 19, 1983, Ser. No. 533,283
Claims priority, application Sweden, Oct. 1, 1982, 8205623
Int. Cl.³ H02K *19/00*
U.S. Cl. 310—162 **9 Claims**



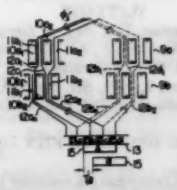
1. A reluctance motor having a rotor (22) of soft magnetic material with two diametrically opposed poles (23,24) of equal size and a stator with two generally diametrically opposed poles (12,13), characterized in that the stator poles (12,13) have windings (14,15) which can be activated separately and in that the stator poles are so designed that the radial line of symmetry (26) of one stator pole (13) forms an angle to the radial line of symmetry (25) of the other stator pole (12), means further being provided which on start drive the two stator windings (14,15) alternately and in continuous operation drive the windings simultaneously.

4,467,234

ARMATURE OF ROTATING MACHINE WITH MEANS TO BALANCE THE MUTUAL INDUCTANCE OF ADJACENT PAIRS OF COILS

Kazuo Tahara; Takayuki Matsui, both of Hitachi; Hisaya Sasamoto, Mito; Haruo Koharagi; Noriyoshi Takahashi, both of Hitachi, and Akira Takemura, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,685
Claims priority, application Japan, Sep. 24, 1982, 57-164895
Int. Cl.³ H02K *3/48*
U.S. Cl. 310—195 **11 Claims**



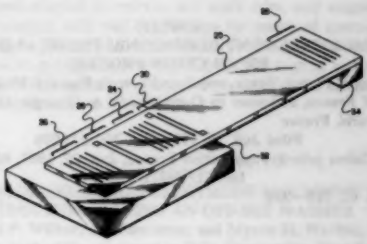
1. An armature of a rotating machine, comprising:
an armature core axially laminated and divided into a pair of members, said armature including a plurality of slots extending in axial direction;
an armature winding including a plurality of coils, wherein at least two coil sides disposed in a slot of a member of said armature core are separated at least into two and disposed in different slots of the other member of said armature core; and
means for setting the position of each coil end in such a manner that the effect of mutual inductance is substantially uniform between every pair of adjacent ends of the coils protruded from the ends of said armature core.

4,467,235

SURFACE ACOUSTIC WAVE INTERFEROMETER

Roger E. De Wames, and Edward J. Staples, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 12, 1982, Ser. No. 357,398
Int. Cl.³ H03H *9/76*
U.S. Cl. 310—313 D **8 Claims**



1. A surface acoustic wave interferometer, comprising:
a substrate;
a first reflector and a second reflector disposed on said substrate to define a multimode resonant cavity therebetween;
a third reflector disposed on said substrate, said second and third reflectors defining therebetween a single mode resonant cavity aligned with said multimode cavity;
an input transducer disposed on said substrate for generating surface acousitc waves in said single mode cavity; and
an output transducer disposed on said substrate for detecting the interference between surface acoustic waves in said single mode cavity and in said multimode cavity.

4,467,236

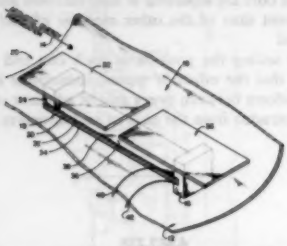
PIEZOELECTRIC ACOUSTO-ELECTRIC GENERATOR

Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Filed Jan. 5, 1981, Ser. No. 222,649
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—321 **12 Claims**

1. A piezoelectric generator system for converting acoustic energy in a predetermined frequency range to electric energy, comprising: a piezoelectric bending element; means for mounting said piezoelectric bending element in cantilevered configuration in an acoustic energy path; a planar member and means for supporting said planar member on the free end of said

piezoelectric bending element in spaced relation to said piezoelectric bending element, whereby said planar member sets the



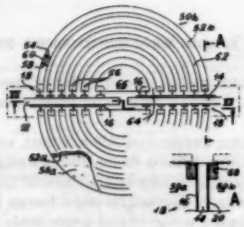
resonant frequency of oscillation of said piezoelectric bending element within said predetermined frequency range.

4,467,237

MULTIELEMENT ULTRASONIC PROBE AND ITS PRODUCTION PROCESS

Bernard Piaget, Venon, and Jean-Francois Piquard, Vizille, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 10, 1981, Ser. No. 272,096
Claims priority, application France, Jun. 25, 1980, 80 14100
Int. Cl.³ H01L *41/22*
U.S. Cl. 310—334 **2 Claims**



1. A multielement ultrasonic probe, comprising: at least one piezoelectric ceramic block constituted by two half-pellets having upper and lower conductive layers;

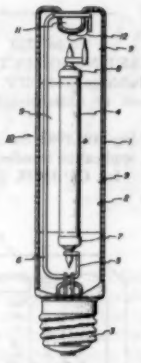
two co-planar printed circuits each having an entirely metallized base and a face providing with parallel conductive strips, the ceramic block being mechanically connected to the two printed circuits by means of an electrically insulating mechanical shock absorber formed from two half cylinders located on either side of the printed circuits, the block being glued to the shock absorber, the upper layer of the block being electrically connected to the face entirely metallized of the printed circuits and the lower layer of the block being connected to the other face of the printed circuits, the ceramic block and the upper part of each printed circuit being entirely cut out to form the piezoelectric elements which are mechanically separated from one another by concentric channels and equidistant with respect to one another and the connections relative to each of them, each printed circuit comprising half its connections which are defined by the entirely metallized faces and the conductive strips.

4,467,238

HIGH-PRESSURE SODIUM LAMP WITH IMPROVED IR REFLECTOR

Seth D. Silverstein, and Jerome S. Prener, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 3, 1981, Ser. No. 298,836
Int. Cl.³ H01J *61/34, 61/38*
U.S. Cl. 313—25 **22 Claims**



1. A high-pressure sodium lamp, comprising:

an elongate, visible-light-transmissive, pressurizable alumina arc tube having electrodes disposed at the opposite ends thereof for establishment of an ionization discharge therebetween, said arc tube having an inside diameter between 10 millimeters and 25 millimeters;

an atomic sodium metal specie disposed in said arc tube, said sodium metal specie upon excitation responsive to said discharge emitting energy in the visible and infrared wavelengths of the electromagnetic spectrum;

an evacuable, outer glass envelope surrounding said arc tube and having an interior surface facing said arc tube; and

a composite IR reflective film deposited upon said interior surface of said outer envelope and consisting of a single layer of each of TiO_2, In_2O_3:Sn, and SiO_2 films sequentially overlaid on said interior surface of said outer glass envelope, said composite film transmitting a substantial portion of said visible wavelength energy and reflecting toward said arc tube a substantial portion of said infrared wavelength energy which is absorbed by said arc tube in an amount sufficient to maintain the wall temperature of said arc tube in an optimum temperature range.

4,467,239

STRUCTURAL UNIT COMPRISING A REFLECTOR AND A HALOGEN CYCLE INCANDESCENT LAMP OF LOW WATTAGE

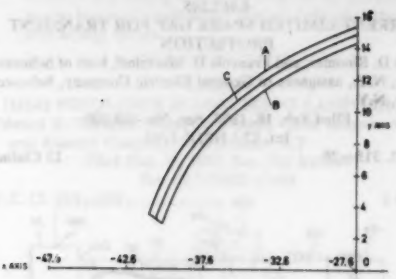
Peter Rakitsch, Ismaning, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,785
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047841
Int. Cl.³ H01J *61/33;* F21V *7/00*
U.S. Cl. 313—113 **2 Claims**

1. A structural unit comprising a reflector (1) and a halogen cycle incandenscent lamp (2) of low wattage for use in super-8 reproduction devices with ground-glass screen projection, wherein the curvature of the reflective area of the reflector (1)

of the structural unit lies within a range which is limited by the hyperbolic curves

A:
$0.1477x^2+1.2617xy+y^2-31.461x+58.1-19y-1577.1=0$ and



B:
$0.1201x^2+1.2503xy+y^2-30.554x+56.0-82y-1449.7=0$

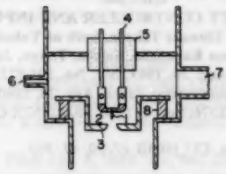
and wherein the value of x is between −27.6 and −41.2.

4,467,240

ION BEAM SOURCE

Masaaki Futamoto, Kanagawa; Isamu Yuito, Ome, and Ushio Kawabe, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 344,186
Claims priority, application Japan, Feb. 9, 1981, 56-17011
Int. Cl.³ H01J *1/16, 19/10*
U.S. Cl. 313—336 16 Claims



1. An ion beam source comprising an ionization chamber, a needle-like tip disposed in the ionization chamber, a support for the needle-like tip, a supply source for a substance to be ionized, and a cathode, the needle-like tip being comprised of a carbide, a nitride, or a diboride of at least one element selected from the group consisting of Ti, Zr, Hf, V, Nb and Ta, a hexaboride of at least one element of rare earth metal elements of atomic numbers 57–70, or carbon.

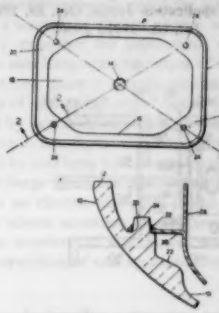
4,467,241

CRT WITH MAGNETIC SHIELD

William A. Hines, Lancaster, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 080,855, Oct. 1, 1979, abandoned. This application Jan. 20, 1982, Ser. No. 342,994
Int. Cl.³ H01J *29/02*
U.S. Cl. 313—402 1 Claim

1. In a funnel assembly for a color television picture tube comprising an elongate hollow glass body of generally frusto-pyramidal configuration which is adapted to receive a neck tube at the smaller end and a faceplate at the larger end, and a magnetic shield supported from and positioned within the interior of said funnel, the improvement comprising a plurality of integrally formed elongate cantilevered lugs positioned in each of four reentrant corners of said funnel, said lugs being tapered and each having a free end and a base having a longitudinal axis in parallel alignment with the longitudinal axis of said funnel, said lugs having their free ends most remote from the



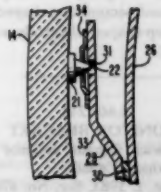
funnel end adapted to receive said neck tube, said magnetic shield coacting with said funnel lugs by means of apertured mounting strips attached to said magnetic shield, a plurality of fasteners or spring tabs positioned over said lugs to bias said magnetic shield against said lugs to immobilize the magnetic shield with respect to said funnel.

4,467,242

COLOR SELECTION ELECTRODE MOUNTING STRUCTURE HAVING AN OFF-SET WASHER

Leonard P. Wilbur, Jr., Lancaster, and Myron H. Wardell, Jr., Lititz, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,936
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—406 3 Claims



1. In a cathode ray tube of the type including a faceplate panel, a plurality of electrode support studs distributed about and attached to said panel, and a color selection electrode including a plurality of support springs, each of said support springs comprising a strap-like element having a proximal end secured to said electrode and a distal end spaced from said electrode, and a washer-like element located between said panel and said distal end of at least one of said strap-like elements, said washer-like element having an aperture therein for snugly receiving one of said studs, the improvement comprising

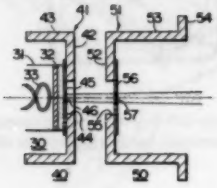
said washer-like element having a substantially flat base portion and a frustoconically shaped portion extending above said base portion, said frustoconically shaped portion being provided with said aperture, said washer-like element having a generally off-set shape to facilitate attachment to said strap-like element.

4,467,243

ELECTRON GUN

Masakazu Fukushima, Tokyo; Masanori Maruyama, Kokubunji; Shigeru Ehata, Mobara; Chihaya Ogusu, Tokyo, and Yukinao Isozaki, Machida, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,869
Claims priority, application Japan, Oct. 29, 1980, 55-150649
Int. Cl.³ H01J 29/46
U.S. Cl. 313—448 11 Claims



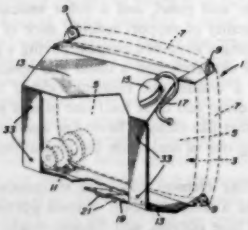
1. An electron gun comprising: a thermionic cathode; a grid having a first aperture; and an anode having a second aperture; said thermionic cathode, said grid and said anode being arranged in the order described, a diameter d_1 of said first aperture being smaller than or equal to a diameter d_2 of said second aperture, said grid and said anode being applied with predetermined positive potentials to form a uniform axial field between said grid and said anode whereby an electron beam between said grid and said anode is formed with no crossover therebetween; said grid including a first cup-shaped electrode whose bottom portion is arranged near an electron emitting surface of said thermionic cathode and has a hole with a diameter larger than said diameter of said first aperture, and a first disk having said first aperture and electrically connected with said first cup-shaped electrode at a place between said thermionic cathode and said first cup-shaped electrode; and said anode including a second cup-shaped electrode whose bottom portion is arranged near said bottom portion of said grid and has a hole with a diameter larger than said diameter of said second aperture, and a second disk having said second aperture and electrically connected with said second cup-shaped electrode on one side of said second cup-shaped electrode where said thermionic cathode is absent.

4,467,244

MONITOR BRACKET

Robert G. Dickie, Keswick, Canada, assignor to Northern Technologies, Ltd., Markham, Canada

Filed Mar. 1, 1983, Ser. No. 471,123
Claims priority, application Canada, May 26, 1982, 403745
Int. Cl.³ H01J 29/96
U.S. Cl. 315—3 9 Claims



1. In a display monitor of the kit type which includes a cathode ray tube (CRT) and video driving circuitry for driving said CRT, the improvement comprising:

mounting means for mounting said video driving circuitry;

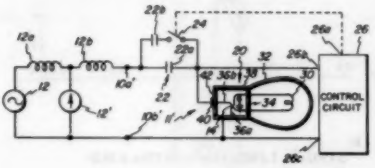
said mounting means being permanently supportingly attached to said CRT.

4,467,245

CURRENT-LIMITED SPARK GAP FOR TRANSIENT PROTECTION

Milton D. Bloomer, and Francois D. Martzloff, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 18, 1983, Ser. No. 468,000
Int. Cl.³ H01K 1/68
U.S. Cl. 315—75 13 Claims



1. A method for providing protection to a load from transients appearing between first and second line conductors providing operating power to the load, comprising the steps of:

providing a spark gap having a predetermined ionization potential;

providing a reactive component in series with the spark gap, said reactive component having a reactance selected to limit any follow-through current through the ionized spark gap to a magnitude survivable by the spark gap; and

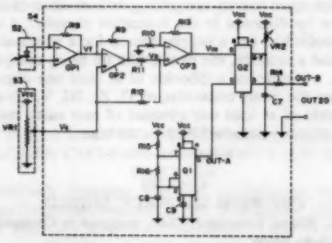
connecting only the reactive element and spark gap in series combination between said line conductors.

4,467,246

LIGHT QUANTITY CONTROLLER AND INPUT DEVICE

Kano Tanaka, and Hiroaki Takeda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,572
Claims priority, application Japan, Aug. 28, 1980, 55/118608; Sep. 1, 1980, 55/121576; Sep. 1, 1980, 55/121577; Oct. 22, 1980, 55/148662
Int. Cl.³ H05B 41/29, 41/392
U.S. Cl. 315—158 18 Claims



1. A light quantity controller comprising:

a light source adapted to emit light upon energization;

means for detecting the light quantity of said light source, and for producing a detection signal;

setting means for manually setting a desired light quantity of said light source, and for generating a reference signal in accordance with the light quantity set;

means for comparing the detection signal and the reference

signal from said setting means, and for producing a comparison result as an output;

means for controlling an amount of an energization signal applied to said light source in accordance with the reference signal from said setting means; and

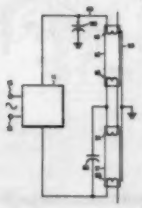
means for adding the output signal from said comparing means to the reference signal to be applied to said control means so that the light quantity detected by said detecting means becomes equal to the desired light quantity set by said setting means.

4,467,247

HIGH FREQUENCY FLUORESCENT LAMP CIRCUIT

Edward E. Hammer, Mayfield Village, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1981, Ser. No. 316,595
Int. Cl.³ H05B 37/00
U.S. Cl. 315—189 2 Claims



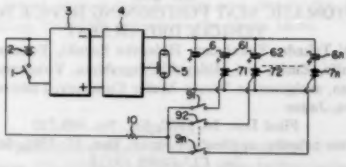
1. A high-frequency fluorescent lamp circuit for starting and operating two or more fluorescent lamps connected in electrical series at a frequency of about 20 kHz or greater, said circuit having a pair of conductors for connection across said series-connected lamps, wherein the improvement comprises a conductive member connected to electrical ground and disposed adjacent and substantially parallel to said lamps; and a capacitor having a value of capacitance at or between about 0.001 and 0.01 microfarads connected between one of said conductors and said conductive member.

4,467,248

VARIABLE ELECTRONIC FLASH LIGHT EQUIPMENT

Koji Watanabe, and Michio Yagi, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,456
Claims priority, application Japan, Apr. 9, 1980, 55-47119[U]; Apr. 9, 1980, 55-47120[U]
Int. Cl.³ H05B 41/32
U.S. Cl. 315—241 P 2 Claims



1. An electronic flash apparatus for outputting a selectively variable discharge illumination, comprising:

a flash lamp;

a power source;

trigger means operable for causing an illumination generating discharge of said lamp;

a main capacitor disposed in parallel connection to said lamp and said power source for storing a primary electric charge and for supporting illumination-generating discharge of said lamp upon operation of said trigger means;

at least one circuit disposed in parallel connection to said main capacitor and said lamp and comprising a series-connected silicon controlled rectifier and secondary capacitor, said circuit being actuatable for selectively storing a secondary electric charge in said secondary capacitor; and

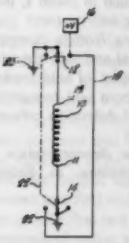
selectively operative switch means for actuating said circuit to cause a secondary electric charge to be stored in said secondary capacitor for application with said primary charge to said lamp upon operation of said trigger means, such that the electric charge available for supporting discharge of said lamp may be varied from that normally provided by said main capacitor by selective actuation of said circuit to thereby increase the amount of illumination produced by said lamp by an amount corresponding to the electric charge stored in said secondary capacitor, and such that no electric charge is stored in said secondary capacitor absent actuation of said circuit to thereby conserve the capacity of said power source and promote efficient operation of said apparatus for flash lamp illumination.

4,467,249

REMOTE AUTOMOBILE WINDOW CONTROL

Judson S. Swearingen, Jr., 27403 Pacific Coast Hwy., Malibu, Calif. 90265

Filed Jul. 9, 1982, Ser. No. 396,608
Int. Cl.³ H02P 1/22
U.S. Cl. 318—282 4 Claims



1. Apparatus for controlling the raising and lowering of a motor vehicle window, comprising:

signal generating means for providing a single, manually-activated signal, remote from a vehicle,

transmitting means located with said signal generating means for communicating said manually activated signal to a vehicle without the use of a physical connection between said signal generating means and said vehicle;

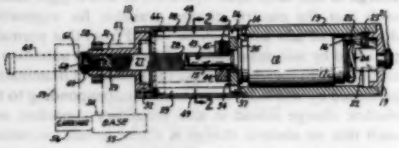
receiving means located in said vehicle for receiving said manually activated signal;

window controlling means responsive to said receiving means for activating a window motor in said vehicle in response to said manually-generated signal to raise or lower a window located in said vehicle, said window control means including a flip flop having an up driver output and a down driver output, an up driver circuit connected to said up driver output of said flip flop and a down driver circuit connected to said down driver output of said flip flop, and termination means for breaking the connection between said flip flop and said up driver circuit with termination of said manually-activated signal.

4,467,250
ELECTRIC MOTOR CONTROLS FOR MECHANICAL ACTUATORS

James T. Thomasson, Sunland, Calif., assignor to Newport Corporation, Fountain Valley, Calif.

Filed Dec. 10, 1982, Ser. No. 448,565
Int. Cl.³ H02P 1/22
U.S. Cl. 318—436 31 Claims



1. In a method of controlling an electric motor including a motor winding, the improvement comprising in combination the steps of:

providing a command velocity signal corresponding to desired motor speed;

effecting operation of said motor by electric energization thereof according to said command velocity signal;

deriving from said motor winding an electric error signal indicative of motor speed;

keeping said derived electric error signal equal to said command velocity signal in energizing said motor;

reducing said command velocity signal to zero volts; and

subjecting said motor to reverse braking action in response to said zero volts command velocity signal.

3. A method as claimed in claim 1, including the steps of:

mechanically stalling said motor;

detecting said stalling from a comparison of said derived electric error signal and said electric energization;

effecting deenergization of said motor in response to said stalling detected from said comparison;

distinguishing in said detection between motor stalling and motor startup; and

effecting said motor deenergization only in response to detected motor stalling, as distinguished from motor startup.

4,467,251
OBJECT SENSING APPARATUS

Bert O. Jönsson, Vintrie, Sweden, assignor to Besam AB, Landskrona, Sweden

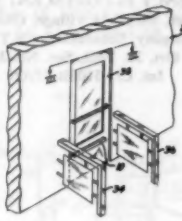
Continuation-in-part of Ser. No. 155,008, May 30, 1980,. This application Feb. 11, 1982, Ser. No. 347,793
Claims priority, application Sweden, May 31, 1979, 7904749
Int. Cl.³ G05B 5/00
U.S. Cl. 318—480 4 Claims

1. Control apparatus for an automatic door having motor operated means for swinging said door open in a selected first direction path from a door frame in response to the approach of an object from a second direction, and for inhibiting operation of said motor operated means in response to the presence of an object in said first direction path of said door, comprising:

a first object sensing apparatus, mounted on said door and facing said first direction;

a second object sensing apparatus, mounted on said door and facing in said second direction;

said first and second sensing apparatus each comprising a plurality of elements, each for emitting a diverging beam of diffuse radiation in response to supplied electrical signals, means for simultaneously supplying electrical signals to all of said elements, a plurality of radiation detecting elements for receiving radiation reflected from an object, and a receiver connected to said detecting elements for



providing an output signal representative of the presence of an object;

and a control circuit for:

(1) activating said motor means to open said door in response to the output signal from said second sensing apparatus;

(2) activating said motor means to maintain said door in an open position in response to the output signal from said second sensing apparatus, and

(3) inhibiting operation of said motor means and preventing opening of said door in response to the output signal from said first sensing apparatus.

4,467,252
AUTOMATIC SEAT POSITIONING DEVICE FOR A VEHICLE DRIVER SEAT

Hitoshi Takeda, Yokohama; Hidetaka Suzuki, Yokosuka; Ken Kamijo, Zushi, and Hideyuki Nagashima, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

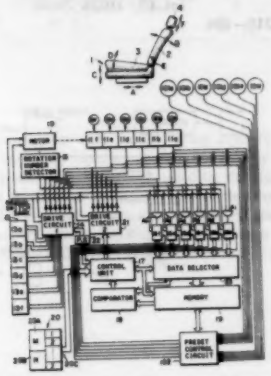
Filed Dec. 14, 1982, Ser. No. 449,737
Claims priority, application Japan, Dec. 17, 1981, 56-202559
Int. Cl.³ G05B 19/28
U.S. Cl. 318—603 5 Claims

1. An automatic seat positioning device for a vehicle driver's seat, comprising:

(a) a seat actuating mechanism including a reversible motor, a plurality of actuators each located within corresponding seat member of said seat for actuating associated seat member of said seat to move at a desired position in a normal or reverse direction within an adjustable range specified depending on the associated seat member, a

plurality of electromagnetic clutches each operatively engaged with the motor for transmitting a rotating force of the motor to the corresponding seat member toward the desired position, and a motor drive circuit, having a plurality of manual reversible switches each provided for the adjustable direction of the individual seat members, which engages one of said electromagnetic clutches with said motor depending on which of said manual reversible switches is activated to specify the adjustable direction of the associated seat member;

(b) a seat position control circuit connected to the reversible motor and motor drive circuit of said seat actuating mechanism having a plurality of reversible counters each counting the number of rotations of said reversible motor for detecting the position of the associated seat member along the corresponding adjustable direction, storage means



operatively storing the counted value of each reversible counter and actuating means operatively actuating said motor drive circuit to rotate in the normal or reverse direction on a basis of the stored seat positional data when the seat position is changed to return an originally set position;

(c) a preset control means which operatively clears and presets each of the counted values of said reversible counters of said seat position control circuit to a preset value so that the corresponding reversible counter indicates an actual position of the associated seat member; and

(d) a plurality of absolute position detection means each located at a position between a maximum adjustable limit and initial position from which the corresponding seat member is moved in one adjustable direction which notifies said preset control means that the associated seat member arrives at the installed position thereof so that said preset control means clears and presets the corresponding reversible counter to the preset value.

4,467,253

DIFFERENTIAL SIGNAL DECODER

David Coyne, Glenrothes, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 5, 1982, Ser. No. 337,208

Claims priority, application United Kingdom, Jan. 6, 1981, 8100253

Int. Cl.³ G05B *21/02*

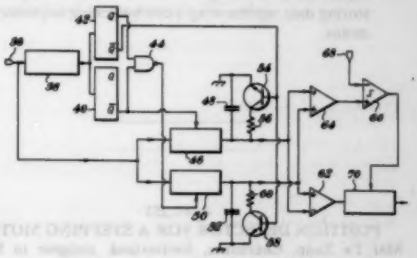
U.S. Cl. 318—636 **30 Claims**

1. A decoder for providing an output signal representative of the scaled difference between first and second input signals, said decoder comprising:

first sampling means, coupled to receive said first input signal and to receive a first command signal, said first sampler being operable in response to the receipt of said first command signal to provide, as output, a first sampled signal representative of said first input signal;

second sampling means, coupled to receive said second input signal and to receive a second command signal, said second sampler being operable in response to the receipt of said second command signal to provide, as output, a second sampled signal representative of said second input signal;

scaling means, coupled to receive said first and second sampled signals and to receive a third command signal, said scaler being operable in response to the receipt of said third command signal to reduce said first and second sampled signals by the same changing fraction to provide



as output a varying first scaled signal representative of said first sampled signal reduced by said same fraction and a varying second scaled signal representative of said second sampled signal reduced by said same fraction;

third sampling means, coupled to receive said first and second scaled signals as input, operable to calculate the sum of and the difference between said first and second scaled signals, and further operable to provide, as the output of said decoder, a decoder output signal representative of said difference between said first and second scaled signals whenever said sum of said first and second scaled signals is equal to a predetermined value; and

control means, coupled to provide in turn said first command signal to said first sampling means, to provide said second command signal to said second sampling means, and to provide said third command signal to said scaling means.

4,467,254

MOTOR TRANSLATOR

Ernest Zucco, Jr., 64 Hooper St., Chelsea, Mass. 02150

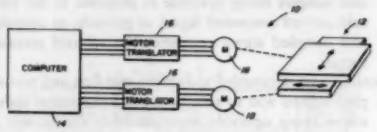
Filed Sep. 26, 1980, Ser. No. 191,135

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **1 Claim**

1. In combination with a multiple coil motor, a device for controlling the motor, said device comprising:

(a) means for generating command signals;
(b) input means for receiving said command signals,
(c) an up/down binary coded decimal counter connected to said input means for receiving said command signals and generating direction signals; and



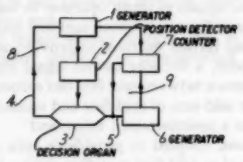
(d) a read-only memory connected to said counter for receiving said direction signals and for generating drive signals for controlling the motor, said read-only memory storing data representing a coil switching sequence of the motor.

4,467,255

POSITION DETECTOR FOR A STEPPING MOTOR

Mai Tu Xuan, Chavannes, Switzerland, assignor to Societe Suisse Pour L'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Continuation of Ser. No. 165,873, Jul. 3, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 357,954
Claims priority, application France, Jul. 9, 1979, 79 18170
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **5 Claims**



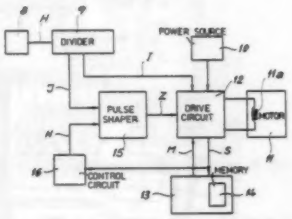
1. A feed method for a single phase timepiece stepping motor adapted to control the operation of the motor by applying thereof either a first type of bipolar pulses of relatively small width or a second type of bipolar pulses of greater width, successive pulses whether of the first or second type being separated by the same predetermined time interval and a sequence of pulses of the second type being applied whenever the motor receives a pulse of a polarity to oppose stepping during application of pulses of the first type, wherein following each pulse of the first type occupying first time period T_1, the motor is open circuited during a second time period T_3, at the beginning of which voltage U_i induced by the motor is measured, applying said sequence of pulses of the second type to said motor when said induced voltage is less than a predetermined value, said sequence beginning following said predetermined time interval after the last pulse of the first type and two alternate polarity pulses of greater width being interposed between said last pulse and the first pulse of said sequence, the first of said two pulses being of a polarity inverted from that of said last pulse.

4,467,256

METHOD AND DEVICE FOR CONTROLLING A STEPPING MOTOR OF A TIMEPIECE

Luciano Antognini, Champaign, Ill., and Hans-Jürgen Rémus, Neuchatel, Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Sep. 29, 1982, Ser. No. 426,316
Claims priority, application Switzerland, Oct. 2, 1981, 6341/81
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—696 **4 Claims**



1. A method for controlling a stepping motor having a winding and a rotor which is magnetically coupled to said winding, from a power supply source having first and second characteristic parameters respectively comprising its electromotive force and its internal resistance, comprising producing drive pulses which are chopped at a given chopping duty cycle and which are formed by a series of elementary pulses separated by periods of interruption, each of said periods of interruption having a first stored duration and each of said elementary pulses having a second stored duration, applying said drive pulses to said winding, and modifying, at given times, said chopping duty cycle in dependence on the variation in at least one of said characteristic parameters.

4,467,257

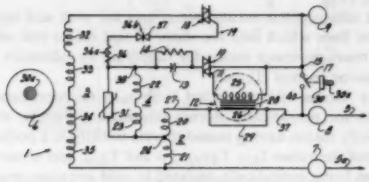
MULTIPLE SPEED INDUCTION MOTOR

Robert H. Douthart, Burlington, N.C., and Howard W. Smith, West Carrollton, Ohio, assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 7, 1982, Ser. No. 433,244
Int. Cl.³ H02P *1/48*
U.S. Cl. 318—774 **19 Claims**

1. A multiple speed motor comprising a first speed winding means, a second speed winding means, a start winding means, three power terminals including a first power terminal connected to the first speed winding and a second power terminal connected to the second speed winding and a common power terminal connected to said first and second speed windings, first and second separate switch means for said start winding

means and for the second of said first and second speed winding means, a speed responsive switch means, circuit means connecting said start winding means to said common power terminal and to one of said first and second power terminals and connecting said start winding means to the other of said first and second power terminals in series with said speed responsive switch means, and said separate switch means and



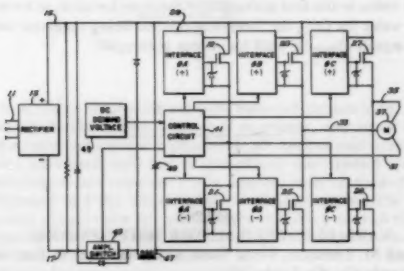
said speed responsive switch means being constructed and connected to conjointly operate to simultaneously energize said first speed winding and said start winding during an initial start period and at selected speed operable to de-energize said start winding and to energize only one of said first speed winding and said second speed winding in accordance with the power connection to said first and second power terminals.

4,467,258

POWER FACTOR CORRECTION FOR VARIABLE SPEED DRIVE

John M. Leuthen, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 20, 1982, Ser. No. 451,695
Int. Cl.³ H02P 5/40
U.S. Cl. 318—800 **5 Claims**



1. In a system for varying the speed of a motor, the system having rectifying means for converting AC voltage supplied by a power source to DC voltage on a positive rail and a negative rail, and frequency switch means for alternately connecting the rails to power conductors at a variable rate to define a voltage frequency, an improved means to vary the amplitude of the DC voltage on the rails to improve the power factor, comprising in combination:

amplitude switch means for alternately switching on and off the DC voltage in one of the rails;

pulse width means for providing amplitude pulses of duration proportional to the voltage frequency, and for actuating the amplitude switch means with the amplitude pulses to vary the DC voltage on the rails;

current sensing means for sensing a current waveform in one of the conductors;

phase detector means for providing phase difference pulses with widths corresponding to a difference in phase between the current waveform and the voltage frequency; and

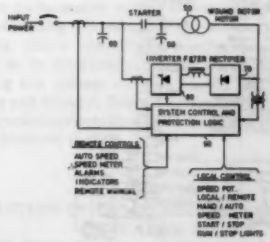
averaging means for providing to the pulse width means an average DC value proportional to the widths of the phase difference pulses to reduce the DC voltage on the rails proportional to the average DC value.

4,467,259

SLIP ENERGY RECOVERY CONTROL SYSTEM USING HYBRID INVERTER TO IMPROVE QUADRATURE CURRENT CONSUMPTION

David L. A. Duff, Burlington, Canada, assignor to Rumble Equipment Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 411,847, Aug. 26, 1982,. This application Apr. 11, 1983, Ser. No. 483,817
Int. Cl.³ H02P 5/40
U.S. Cl. 318—800 **9 Claims**



1. A slip energy recovery system for a wound rotor motor having an AC supply source of at least one phase: said system including rectifying means and a hybrid inverter each having the same number of phases as said source connected between the wound rotor of said motor and said source for converting AC power from said rotor to DC power and for inverting said

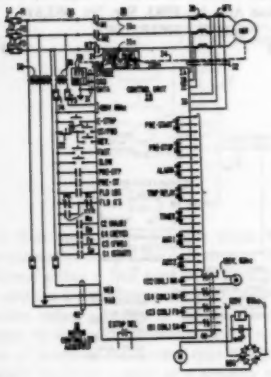
DC power to AC power for delivery to said source, said hybrid inverter including in each phase thereof first and second groups of gate-controlled, bistable, unidirectional conducting devices; and means for controlling the operation of said first and second groups of bistable unidirectional conducting devices in each said phase of said hybrid inverter such that said first bistable unidirectional conducting device group is continuously in the inversion mode and gated into conduction at a fixed firing angle while said second bistable unidirectional conducting device group is gated into conduction at a second firing angle of from 0° to 180°, whereby said hybrid inverter produces zero quadrature current at full speed of said motor, zero volts at maximum motor current and maximum volts at zero motor current.

4,467,260

MOTOR CONTROL APPARATUS WITH ROTOR HEATING PROTECTION

George T. Mallick, Jr., Penn Hills, and Pamela M. Maynard, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 20, 1983, Ser. No. 486,978
Int. Cl.³ H02H 7/08
U.S. Cl. 318—800 **1 Claim**



1. Motor control apparatus, comprising:

contactor means interconnected with the input power lines of a motor for being opened upon command to stop said motor;

microprocessor means interconnected with said contactor means for supplying a command signal thereto when the motor rotor temperature (Q(t)) is equal to Q_{max}, a value which is related to the locked rotor current (I_{LR}) and small time T_{STALL} for the motor;

temperature measurement means interconnected with the stator of said motor and with said microprocessor means for supplying an indication of the temperature of said stator (T_S);

current measurement means interconnected with said input power lines which feed the stator of said motor and with said microprocessor means for supplying an indication of the stator current (I); and

memory means interconnected with said microprocessor means for periodically storing information therein, said memory means having stored therein initially in a portion thereof the values I_{LR}, T_{STALL}, α and T_{Lim}, said memory means being periodically updated by said microprocessor means to reflect recent values of T_S and I, said memory means having a first accumulator memory location in which the accumulative value of the square of the current I is stored by said microprocessor means, said memory means having a second accumulator memory location in which the value:

$$Q(t) - \left[\frac{T_S \times I_{LR}^2 \times T_{STALL}}{T_{Lim} - 40} \right]$$

is stored by the microprocessor means, said microprocessor means periodically comparing the value Q(t) with a value Q_{max} to determine if said command signal should be sent, said microprocessor means initially making the calculation Q(t) equal the latest value of

$$\frac{T_S \times I_{LR} \times T_{STALL}}{T_{Lim} - 40},$$

said microprocessor means then determining a new value of Q(t) by adding the value recently accumulated in the first accumulator memory location said new value of Q(t) being then placed in the second accumulator memory location by the microprocessor means to form a new value in the second accumulator, memory location, the value from the second accumulator memory location being then multiplied by the value α in the microprocessor means and subtracted from the later value in the first accumulator memory location to form a new value for Q(t), the foregoing process being repeated until Q(t) equals Q_{max} or until the motor is stopped.

4,467,261

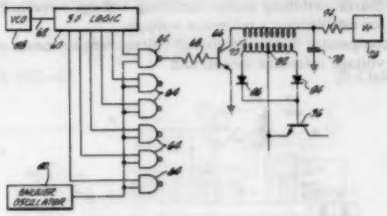
VARIABLE SPEED MOTOR DRIVE SYSTEM

Donald M. Lamaster, Costa Mesa, Calif., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 12, 1982, Ser. No. 397,031
Int. Cl.³ H02P 5/36
U.S. Cl. 318—810 **5 Claims**

1. A method of controlling the speed of a polyphase alternating current motor driven by an inverter comprising the steps of:

supplying current to the motor via transistors having relatively slow switching speeds;



selectively driving the transistors from a carrier signal comprising a series of pulses, having a repetition rate faster than the switching speed of the transistors.

4,467,262

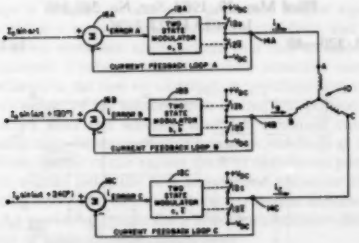
POLYPHASE MOTOR DRIVE SYSTEM WITH BALANCED MODULATION

William P. Curtiss, Winthrop, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation of Ser. No. 133,531, Mar. 24, 1980, Pat. No. 4,306,182. This application Dec. 14, 1981, Ser. No. 330,655 The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ H02P 5/40

U.S. Cl. 318—811 **5 Claims**



1. A motor control system with balanced excitation for an n phase induction motor, where n is an integer, said motor having a rotor and a stator with n terminals, each of said terminals being associated with one of said phases, said control system including means responsive to a variable level of desired slip frequency and the sensed level of effective mechanical frequency of said rotor for generating a frequency control signal representative of desired stator excitation frequency, wherein the improvement comprises

means for generating a current control signal representative of a desired stator current peak amplitude as a function of desired slip frequency,

n switch networks, each of said switch networks including means for applying selected ones of a plurality of dc voltage levels to a respective one of said terminals in response to an applied switch control signal,

sensing means for producing n feedback signals, each of said feedback signals being representative of the instantaneous current passing through a corresponding one of said terminals,

means responsive to said frequency control signal and said current control signal for generating n command signals, each of said command signals being associated with one of said n terminals, and having identical frequency corresponding to said desired stator excitation frequency and identical peak amplitude corresponding to said desired stator current peak amplitude, and having the same phase relationship as that of the associated one of said n terminals,

means for producing n error signals, each error signal being associated with one of said n terminals and being representative of the difference between the corresponding command signal and feedback signal for said associated terminal,

n multistate modulation means for generating said switch control signals,

wherein said n modulation means are responsive to the respective ones of said n error signals to generate n switch control signals and to apply said n switch control signals to the respective n switch networks.

4,467,263

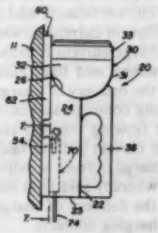
RECHARGEABLE BATTERY-POWERED FLASHLIGHT SYSTEM

Frederick J. Conforti, Aurora, and Kenneth R. Fenne, Glen Ellyn, both of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Jan. 31, 1983, Ser. No. 462,550

Int. Cl.³ H02J 7/00

U.S. Cl. 320—2 **17 Claims**



1. In a rechargeable battery-powered device, the improvement comprising a housing for the device, a recharging plug including plural electrically conductive terminal prongs adapted to be electrically coupled to the device, and means mounting said prongs on said housing for rotation about a common axis between first and second positions, such that said prongs project externally of said housing in both the first and second positions thereof.

4,467,264

BATTERY CHARGER WITH VISUAL CHARGE INDICATING MEANS

Charles R. Blake, Cupertino, Calif., and Ferdinand H. Mullerman, Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 60,609, Jul. 25, 1979, abandoned. This application Aug. 16, 1983, Ser. No. 523,298

Int. Cl.³ H02J 7/00

U.S. Cl. 320—2 **19 Claims**

15. An electrochemical cell charging apparatus for providing charging current to a cell connected between one of two sets of charging terminals associated with such apparatus:

(a) means for connection to an alternating current source;

(b) a charging network including at least one rectifier for

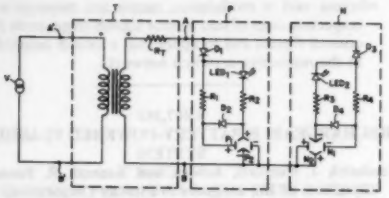
converting alternating current from said source into unidirectional charging current;

(c) first and second current branches disposed in said charging network;

(d) terminal means for receiving charging current disposed in said first and second current branches, said terminal means including first and second sets of charging contacts disposed in said first and second current branches respectively;

(e) means disposed in said charging network for rendering said first current branch inoperative when charging current is delivered to a rechargeable cell via said second current branch and for rendering said second current branch inoperative when charging current is delivered to a rechargeable cell via said first current branch;

(f) a light emitter connected in said first current branch and emitting light in response to the delivery of charging current to a rechargeable cell via said first set of charging



and in response to the flow of charging current to a rechargeable cell via said second set of charging contacts; and

(g) a unidirectional current flow device connected electrically between said first and second current branches and establishing a current path between said light emitter and said second current branch, said current flow device preventing the flow of current between said current branches when said charge current is delivered via said first set of contacts whereby said light emitter emits light only in response to the delivery of charging current via said first set of charging contacts, said current flow device permitting current flowing through said light emitter to flow through said current path to said second current branch when said charge current is delivered via said second set of contacts whereby said light emitter emits light only in response to the delivery of charging current via said second set of charging contacts.

4,467,265

BATTERY CHARGER

Alton G. Hierholzer, Jr., Seguin, Tex., assignor to Wide-Lite International Corporation, San Marcos, Tex.

Continuation of Ser. No. 225,374, Jan. 15, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,623

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—17 **3 Claims**

1. A battery charger, comprising

first switching means connectable to a dc charging source for supplying substantially constant, relatively high charging current at a first amplitude to a battery under charge for charging the battery to a predetermined high voltage above a float voltage maximum,

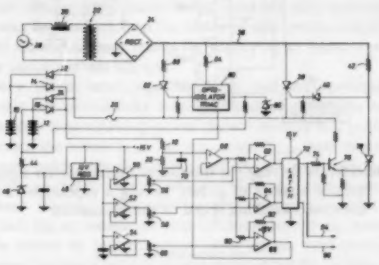
voltage sensing means connected to the battery,

second switching means connected to said voltage sensing means for disconnecting said first switching means when the voltage on the battery rises to said predetermined high voltage,

third switching means connectable to the dc charging source for supplying a relatively low trickle charging current at a second amplitude to the battery when the voltage on the battery drops to a float voltage minimum and removing the low trickle charging current to the battery when the voltage on the battery rises to the float voltage maximum, and

fourth switching means connected to said voltage sensing means for reconnecting said first switching means to the battery when the voltage on the battery drops to a predetermined low voltage below the float voltage minimum, said fourth switching means including voltage reference means for establishing a reference voltage,

a comparator connected to said voltage sensing means and said voltage reference means, and



a latch connected to the output of said comparator and to the input of said second switching means for resetting said latch when the voltage on the battery drops to said predetermined low voltage below the float voltage minimum for switching said second means to connect said first switching means to said dc charging source, said latch setting when the voltage on the battery rises to said predetermined high voltage above the float voltage maximum for disconnecting said first switching means from said dc charging source.

4,467,266

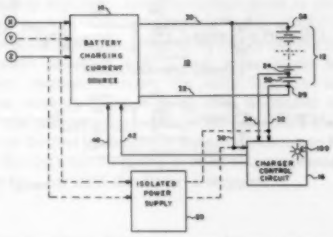
BATTERY OVERCHARGE PROTECTION SYSTEM

John A. Ritchie, Jefferson Township, Morris County, N.J., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 29, 1982, Ser. No. 363,240

Int. Cl.³ H02J *7/04*

U.S. Cl. 320—40 **14 Claims**



1. A battery charging system for charging a battery bank having a plurality of cells, said battery charging system comprising;

a battery charging current source coupled electrically to said battery bank,

a charger control circuit connected to only one of said plurality of cells including means for monitoring the voltage across said one cell, said charger control circuit also being connected to said battery charging current source for controlling the charging current from said source to said battery in response to the monitored voltage of said one battery bank cell, said charger control circuit including an overcharge sensor circuit portion and a shorted cells sensor circuit portion said overcharge and shorted cell sensing circuit portions being coupled to said battery

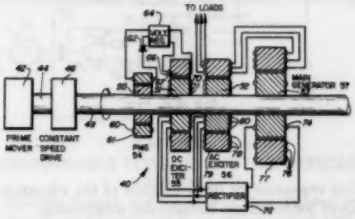
bank for determining the condition of said battery bank by monitoring the potential of said one monitored cell.

4,467,267

ALTERNATOR EXCITATION SYSTEM

David J. Hucker, Rockford, Ill., and Norbert L. Schmitz, Middleton, Wis., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 28, 1983, Ser. No. 462,017
Int. Cl.³ H02P *9/10, 9/30*
U.S. Cl. 322—61 **20 Claims**



1. In an alternator driven by a source of motive power for energizing a load having an exciter for developing an exciter output current, a main generator coupled to the load and to the exciter for developing output currents from the exciter output current, means including a source of direct current for establishing an exciter field, each of the exciter and main generator having a moving rotor assembly coupled to the source of motive power and a stationary stator disposed adjacent the rotor with the rotor assembly and stator having conductors disposed thereon forming field and armature coils, the improvement comprising:

the exciter field coils include first and second sets of field windings wherein the first set of field windings is coupled to the source of direct current to establish a first portion of the exciter field and wherein the second set of field windings is coupled to the main generator output signals to establish a second portion of the exciter field; and

the exciter armature coils include first and second sets of armature windings wherein a first armature current is induced in the first set of armature windings as a result of movement of the exciter rotor in the first portion of the exciter field and wherein a second armature current is induced in the second set of armature windings as a result of movement of the exciter rotor in the second portion of the exciter field, the first and second armature currents being combined to form the exciter output current.

16. An excitation system for a brushless alternator driven by a source of motive power, comprising:

a main generator coupled to and supplying power to a load, the main generator having an armature coil, a field coil for establishing a main generator magnetic field in space occupied by the main generator armature coil and means for coupling the main generator to the source of motive power such that the armature coil and the main generator magnetic field move relative to one another to develop main generator output power in the armature coil;

an exciter having an exciter field coil connected in series between the main generator armature coil and the load so that the exciter field coil carries the main generator AC output current to establish an alternating exciter magnetic field, an exciter armature coil within the exciter magnetic field, the coupling means also coupling the exciter to the source of motive power such that the exciter magnetic field and the exciter armature coil move relative to one another to develop an exciter output current in the exciter armature coil; and

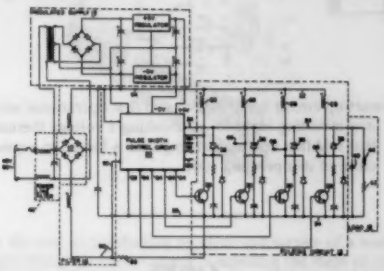
means for connecting the exciter output current to the main generator field coil to establish the main generator magnetic field.

4,467,268

DIGITALLY CONTROLLED POWER SUPPLY

Derek Chambers, Bayville, N.Y., and Dee Wang, Londonderry, N.H., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 364,118, Mar. 31, 1982, abandoned, which is a continuation of Ser. No. 145,288, Apr. 30, 1980, abandoned. This application Aug. 3, 1983, Ser. No. 519,217
Int. Cl.³ G05F *1/00*
U.S. Cl. 323—222 **4 Claims**



1. A power supply comprising:

means supplied from a source of alternating current power for providing rectified power which is substantially unfiltered at the frequency of said alternating current power;

means supplied by said rectified power for producing pulses of power, said producing means comprising a switch and means for controlling said switch, said producing means storing energy when said switch is in a first state and producing one of said power pulses when said controlling means switches said switch to a second state, said controlling means switching said switch at a frequency substantially greater than the frequency of said alternating current source;

the voltage amplitudes of said pulses being greater than the voltage amplitude of said alternating current power; and

said controlling means controlling said switch wherein said frequency and the duty cycle between said first and second states are substantially constant over a cycle of said alternating current.

4,467,269

START-UP CIRCUIT FOR NEGATIVE INDUCTANCE MULTIPLIER

Thomas J. Barzen, Addison, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

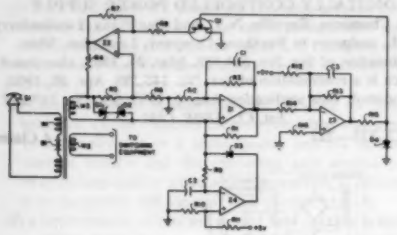
Filed Oct. 26, 1982, Ser. No. 436,870
Int. Cl.³ H01F *27/42, 40/14*
U.S. Cl. 323—356 **5 Claims**

1. An arrangement for correcting for transformer characteristics comprising in combination: a transformer including a magnetic core, a primary, a secondary and a tertiary winding thereon;

an impedance simulating network comprising: a first operational amplifier having an inverting and a non-inverting input and an output, with first and second means connecting said respective inputs to the terminals of said tertiary winding including feedback circuitry for establishing voltages and currents which affect said transformer as if a negative inductance having a magnitude proportional to the magnetizing inductance of said transformer, and a negative resistance having a magnitude proportional to the resistance of said tertiary winding,

a self adjusting positive resistance means, in series with said impedance simulating network, automatically adjustable

to a magnitude to effectively cancel the negative resistance equivalent to the degree of increase in resistance of said tertiary winding; and



a start-up circuit connected to said first operational amplifier non-inverting input for establishing a voltage thereat such that said first operational amplifier is forced to a condition close to its operating state.

4,467,270

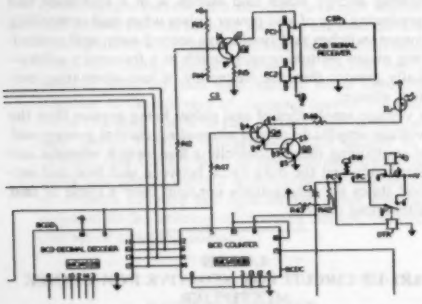
AUTOMATIC DEPARTURE TEST UNIT FOR CAB SIGNAL EQUIPMENT

John M. McElroy, Monroeville, and Charles E. Janney, Plum Borough, both of Pa., assignors to American Standard Inc., Swissvale, Pa.

Filed Mar. 31, 1981, Ser. No. 306,020

Int. Cl.³ G01R *31/02*; B61L *21/00*

U.S. Cl. 324—51 **17 Claims**



1. An automatic departure test unit for cab signal equipment comprising, first means for producing a plurality of coded carrier signals representing a series of speed commands, second means for producing a plurality of simulated speed signals, third means for causing said first means to produce one of said plurality of said coded carrier signals and for causing said second means to produce a corresponding one of said plurality of said simulated speed signals, fourth means for receiving said plurality of said coded carrier signals for checking the operability of a cab signal receiver, fifth means for checking the correspondence between said ones of said plurality of said coded carrier signals and said plurality of said simulated speed signals, and sixth means for verifying the functionality of overspeed operation by increasing said simulated speed signals to cause the release of an underspeed relay whereby each speed command of the series of said plurality of coded carrier signals and corresponding simulated speed signals is sequentially processed until the occurrence of a failure or until the completion of the test.

4,467,271

TEST APPARATUS FOR DETERMINATION OF VIBRATION CHARACTERISTICS OF PIEZOELECTRIC TRANSDUCERS

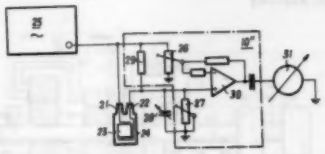
Friedrich Ruckenbauer, and Peter Krempl, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jan. 19, 1982, Ser. No. 340,882

Claims priority, application Austria, Feb. 10, 1981, 613/81

Int. Cl.³ G01R *29/22*

U.S. Cl. 324—56 **10 Claims**



1. Test apparatus for determination of the vibration characteristics of piezoelectric transducers, comprising:

an AC generator for generating an excitation signal and connected to aa piezoelectric transducer to induce mechanical vibration thereof by the inverse piezoelectric effect induced by said excitation signal;

measuring means for measurement of said mechanical vibration and including subtraction means having an input connected to the excitation signal of said AC generator and another input responsive to the electrical response signal output of said piezoelectric transducer, and further including a voltage-dividing impedance chain connected to said subtraction means for phase compensating said excitation signal, said piezoelectric transducer forming part of said impedance chain and said electric response signal being derived from said impedance chain, said subtraction means including an operational amplifier having a differentiating input with one input thereof responsive to the output of said AC generator and another input responsive to said electrical response signal; and

evaluation means responsive to the output of said operational amplifier for deriving a measurement signal from the difference between said electrical response signal and a signal proportional to the AC generator excitation signal.

4,467,272

CIRCUIT FOR MEASURING INDUCTANCE CHANGES

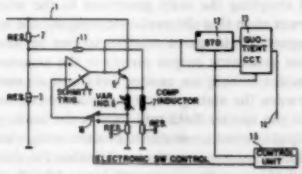
Albin Hassler, Schwieberdingen, and Eckehart Friz, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,402

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117808

Int. Cl.³ G01R *11/52, 27/26*

U.S. Cl. 324—59 **9 Claims**



1. Apparatus for measuring inductance changes in a variable inductor (6) comprising in combination therewith:

a comparison inductor (7) of substantially fixed inductance value;

a first resistance (9) in series with said variable inductor for providing therewith a time-constant circuit branch;

a second resistance (8) in series with said comparison inductor for providing therewith a second time-constant circuit branch;

a Schmitt trigger circuit connected for producing oscillation between its switching threshold stages timed selectively by said first or said second time-constant circuit branch in accordance with the setting of a selector switch (10), and

means for comparing pulses of said oscillations timed by said first time-constant circuit branch with pulses of said oscillations timed by said second time-constant circuit branch.

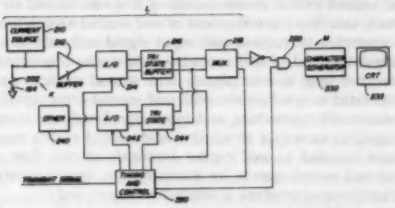
4,467,273
INTERCHANGEABLE COMPONENT IDENTIFICATION SYSTEM

Dale C. Rudolph, Parker, and Michael D. Ray, Denver, both of Colo., assignors to Technicare Corporation, Solon, Ohio

Division of Ser. No. 972,435, Dec. 22, 1978, Pat. No. 4,244,227, which is a continuation-in-part of Ser. No. 907,408, May 18, 1978, Pat. No. 4,196,630. This application Sep. 29, 1980, Ser. No. 191,576

Int. Cl.³ G01R *27/02*; G08B *1/08*; H04Q *1/30*

U.S. Cl. 324—65 R **7 Claims**



1. An interchangeable component identification assembly comprising:

(a) at least a first component having first coupling means at one end;

(b) an identification means operatively connected with said first coupling means including an impedance assembly having an impedance characteristic of said first component for identifying said first component;

(c) an apparatus including a second coupling means sized to mate with said first coupling means whereby said first component and said apparatus are adapted for interconnection;

(d) impedance determination means operatively connected with said second coupling means for determining impedance whereby said impedance determining means determines the charcteristic impedance of the identification means of a component interconnected with the assembly; and

(e) generating means operatively connected with said impedance determination means for generating a representation of the determined impedance whereby the generating means generates a representation identifying a component interconnected with said assembly;

wherein said generating means includes a character generator for transforming said determined characteristic impedance into an alpha-numeric representation and a cathode ray tube operatively connected to said character generator upon which said alpha-numeric representation is displayed.

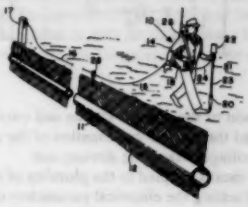
4,467,274
ELECTRICAL SURVEYS OF UNDERWATER OR UNDERGROUND STRUCTURES WITH ELECTRODE-TO-ELECTROLYTE POTENTIAL CORRECTION

James B. Bushman, Medina, Ohio; Clark P. Weldon, and Stephen L. Wolfson, both of Houston, Tex., assignors to Harco Corporation, Medina, Ohio

Filed May 15, 1981, Ser. No. 264,200

Int. Cl.³ G01V *3/08, 3/15*; G01R *31/02*

U.S. Cl. 324—71.1 **28 Claims**



1. A method of conducting an electrical survey of a buried structure along the route thereof comprising the steps of electrically connecting one end of a wire to an electric potential sensing cell, securing a stationary reference electrode at a location along the route of the survey with one end of economically disposable wire from a wire supply connected to such electrode, moving the cell along the structure while playing out the economically disposable wire, at plural locations along the structure periodically obtaining measured electrode-to-electrolyte potential values, obtaining a measured structure-to-electrolyte potential value, and correcting such electrode-to-electrolyte potential values utilizing such measured structure-to-electrolyte potential value.

13. A method of conducting an electrical survey of a buried structure along the route thereof comprising the steps of connecting one end of an economically disposable wire from a wire supply to the structure, electrically connecting a wire to an electric potential sensing cell, moving the cell along the structure while playing out the economically disposable wire, at plural locations along the structure periodically obtaining measured structure-to-electrolyte potential values, the improvement comprising after an accidental or intentional disconnecting of the economically disposable wire occurs as the survey is being carried out at a location along the route of the structure, placing a stationary electrode approximately at or slightly before such location with the economically disposable wire from the supply connected to the electrode, and then continuing the survey along the route of the structure by playing out such economically disposable wire and periodically obtaining electrode-to-cell potential values.

4,467,275
DC CHARACTERISTICS MEASURING SYSTEM

Koichi Maeda, and Haruo Ito, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 15, 1982, Ser. No. 434,657

Claims priority, application Japan, Oct. 29, 1981, 56-173654

Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 AT **4 Claims**

1. A system for measuring the DC electrical chracteristics of an electric element, said system comprising:

a plurality of measuring unit means for electrically stimulating said electrical element and measuring the electrical response of said electrical element thereto, each of said plurality of measuring unit means having

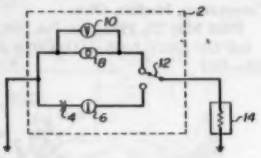
a variable DC voltage source having a first control input,

a DC current measuring device connected in series with the variable voltage source,

a variable DC current source having a second control input,

a DC voltage measuring device connected in parallel with the variable current source, and

switch means coupled to the electrical element to be measured, said switch means for selecting between the series



combination of the voltage source and current measuring device, and the parallel combination of the current source and the voltage measuring device; and

a controller means coupled to the plurality of measuring unit means for setting the electrical parameters of said measuring unit means.

4,467,276

ARRANGEMENT FOR EVALUATING AN OPTICAL BEAM

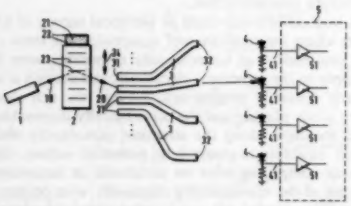
Peter Marten, Blaustein, and Edgar Weidel, Senden, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,209

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114596; Feb. 4, 1982, 3203679

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 R **12 Claims**



1. An arrangement for evaluating a light beam comprising a source of coherent light for generating an input light beam, a Bragg-cell for receiving the input light beam and transmitting an output light beam, signal means connected to said Bragg-cell for applying a signal to said Bragg-cell to oscillate said Bragg-cell and thus oscillate said output light beam, a plurality of lightwave guides each having an entrance gate coupled to said Bragg-cell for receiving said output light beam and an exit gate, a photodetector optically coupled to each lightwave guide exit gate, and an evaluating unit connected to each photodetector for receiving a signal therefrom corresponding to oscillations of said output light beam past each photodetector, and evaluating said photodetector signal, said plurality of light wave guides each having closely spaced entrance gates, and said exit gates being spaced further apart than the spacing between said entrance gates, said signal means connected to said Bragg-cell being adapted to provide an RF signal to said Bragg-cell, said evaluating unit including an alarm device connected to an output of each of said photodetectors for detecting the presence of at least one RF signal from at least one of said photodetectors, said alarm device having an output for supplying said at least one RF signal.

4,467,277

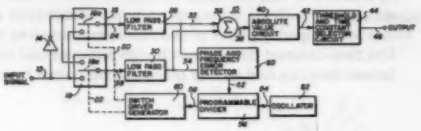
PROGRAMMABLE DETECTOR FOR TONE SIGNALS

Gary P. Jones, Seminole, and Myles A. Larson, St. Petersburg, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Feb. 4, 1982, Ser. No. 345,739

Int. Cl.³ G01R *23/02*

U.S. Cl. 324—78 R **9 Claims**



1. A detector circuit comprising,

first and second switch means;

means for generating an inverse signal of an input signal;

means for generating first and second periodic drive signals, said drive signals orthogonal to each other;

means for connecting said first and second drive signals to said first and second switch means, respectively;

said first switch means including first and second input terminals, said first input terminal connected to receive said input signal and said second input terminal connected to receive said inverse signal, said first switch means operated in synchronism with said first drive signal for alternately connecting said input signal and said inverse signal to an output terminal of said first switch means;

said second switch means including first and second terminals, said first input terminal of said second switch means connected to receive said input signal and said second input terminal of said second switch means connected to receive said inverse signal, said second switch means operated in synchronism with said second drive signal for alternately connecting said input signal and said inverse signal to an output terminal of said second switch means;

means coupled to said output terminals of said first and second switch means for summing the signals received therefrom to produce a summation signal; and

means for detecting when said summation signal exceeds a preset threshold.

4,467,278

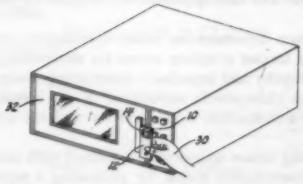
MICROWAVE OVEN LEAK DETECTOR

Emery K. Toth, 26241 Hidden Valley, Farmington Hills, Mich. 48018, and Lawrence E. Egbert, 1950 S. Winn Rd., Mt. Pleasant, Mich. 48858

Filed Aug. 27, 1981, Ser. No. 296,998

Int. Cl.³ G01R *23/04, 25/02*

U.S. Cl. 324—95 **6 Claims**



1. Means for detecting microwave radiation leakage from a microwave oven, comprising:

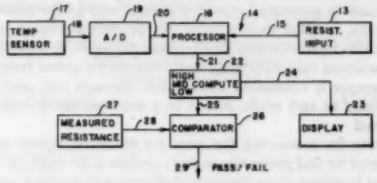
a heat responsive liquid crystal material adapted to produce a color change in response to an increase in temperature of the material; and

first means moistened for contacting the liquid crystal material with a liquid to generate heat in the presence of microwave energy.

4,467,279
TEMPERATURE COMPENSATED RESISTANCE TEST BOARD

Alexander A. MacCormack, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 12, 1981, Ser. No. 233,863
Int. Cl.³ G01R 31/02, 27/02
U.S. Cl. 324—158 MG 11 Claims

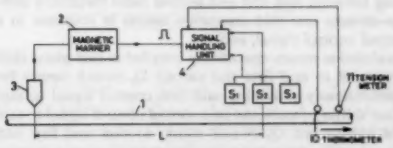


1. In a motor test board for a dynamoelectric machine in which a winding of the dynamoelectric machine is tested for proper resistance value by comparison against a reference, the improvement which comprises means for automatically determining a reference resistance value at an actual ambient temperature to obtain a new reference value corrected for temperature, including sensor means for determining the actual ambient temperature of the winding under test operatively connected to a means for automatically determining the new resistance value based on actual ambient temperature, means for setting a known resistance value at a predetermined temperature for the winding under test operatively connected to the means for automatically determining the new resistance value based on actual ambient temperature, means for automatically determining a new resistance valve of said known resistance setting based on actual ambient temperature operatively connected to said sensor means and said known resistance setting means, means for determining a range of acceptable resistance values for winding resistance based on said new temperature compensated resistance value of said known resistance operatively connected to said automatically altering means, means for measuring the value of resistance of the winding under test operatively connected to a comparing means, means for comparing a measured value of resistance for the winding under test with the determined range of acceptable winding resistance values operatively connected to said range determining means, and output means for indicating the acceptance or rejection of the winding under test based on said last-mentioned resistance comparison.

4,467,280
SYSTEM FOR MEASURING THE LENGTH OF A LONG MAGNETIZABLE MATERIAL

Kenichiro Uehara, and Yoshihiro Nasu, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 19, 1980, Ser. No. 188,911
Claims priority, application Japan, Sep. 28, 1979, 54-126628
Int. Cl.³ G01B 7/04
U.S. Cl. 324—206 5 Claims



1. A system for measuring the length of a long material while it is running axially, said system comprising:

a marking means having a marking head for magnetizing said material at intervals so as to place a magnetic mark thereon,

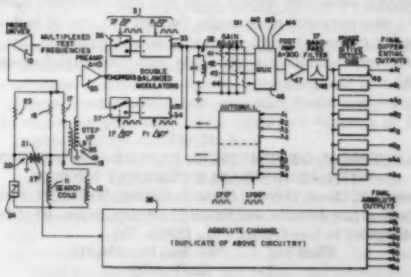
a mark detection means for detecting said magnetic mark, said mark detection means comprising first and second and third sensors for detecting said magnetic mark, said sensors arranged serially in a line along the material moving direction, and

a signal handling means operatively connected to said mark detection means and including means for detecting the point where the difference between the outputs of said first and third magnetic sensors becomes zero while the output of said second magnetic sensor is simultaneously above a predetermined threshold value and for providing a magnetizing pulse to said marking means for enabling the operation of said marking means upon the detection of said point.

4,467,281
MULTI FREQUENCY EDDY CURRENT TEST APPARATUS WITH INTERMEDIATE FREQUENCY PROCESSING

Thomas J. Davis, and Charles B. Perry, both of Richland, Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 29, 1980, Ser. No. 125,895
Int. Cl.³ G01N 27/72; G01R 33/12
U.S. Cl. 324—232 12 Claims



1. Eddy current test apparatus including inducing coil means adapted to be coupled to an object to be tested to induce eddy currents in said object which currents induce voltages in sensing coil means, said induced voltages containing certain phase and amplitude information;

means for sequentially providing at least two test frequencies, one at a time, to said inducing coil means;

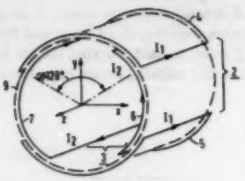
means for receiving and converting the induced voltages in said sensing coil means by said induced eddy currents to an intermediate frequency having a fixed predetermined frequency value independent of the frequency value of each test frequency selected while preserving said phase and amplitude information of said induced voltages, said converting means including first and second choppers and means for driving said first and second choppers at IF∠0° and at IF∠90°, respectively, where IF is the intermediate frequency; and

means for sequentially processing said intermediate frequency to provide in-phase and quadrature components, A_iB_i for each of the test frequencies.

4,467,282
HIGH-FREQUENCY MAGNET SYSTEM FOR NUCLEAR SPIN TOMOGRAPHY

Horst Siebold, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,344
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131946
Int. Cl.³ G01R 33/08
U.S. Cl. 324—309 6 Claims

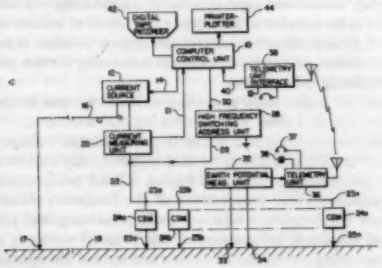


1. A magnet system for generating a high-frequency field in an image-generating apparatus of the type which utilizes nuclear magnetic resonance technology, the magnet system being of the type having a first pair of magnet coils which are arranged on an imaginary cylindrical surface and adapted to receive a first high-frequency current for responsively generating a substantially homogeneous high-frequency field which is directed radially with respect to a central longitudinal axis of the imaginary cylindrical surface, the magnet system further comprising at least a second pair of magnet coils which are arranged on at least one imaginary cylindrical surface and adapted to receive a second high-frequency current which is shifted in phase with respect to the first high-frequency current by a predetermined phase angle, the first and second high-frequency currents having substantial equal amplitudes, for responsively producing a circularly polarized high-frequency field.

4,467,283
ELECTRICAL GEOPHYSICAL EXPLORATION SYSTEM WITH ADDRESSABLE CURRENT PROBES

Thomas E. Owen, Helotes; Glenn T. Darilek; Wendell R. Peters, both of San Antonio, and Edward L. Bryan, Dallas, all of Tex., assignors to Geo-Optics, Ltd., Dallas, Tex.

Filed Sep. 23, 1981, Ser. No. 304,916
Int. Cl.³ G01V 3/02
U.S. Cl. 324—363 4 Claims

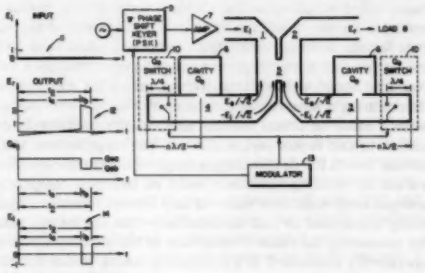


1. An electrical geophysical exploration system comprising:
a source of electric current;
a single conductor cable connected to the output of said current source, said cable having a plurality of longitudinally spaced connection points extending along the surface of the earth;
a plurality of probe means for coupling current into the earth;
a plurality of addressable switching units, each of said switching units being connected between one of said connection points along said cable and one of said probe means, each of said switching units being responsive to a unique address signal to temporarily electrically interconnect its associated connection point and probe means;
means, coupled to said cable, for providing a series of address signals on said single conductor cable to sequentially activate said switching units, whereby current from said source is connected individually through said switching units to said probe means in a predetermined sequence; and
means for measuring the resultant electrical signals generated by said probe means and conducted through the earth at locations along the surface of the earth spaced from said probe means.

4,467,284
RADIO FREQUENCY STORAGE PULSER

Zoltan D. Farkas, 203 Leland Ave., Menlo Park, Calif. 94025

Filed May 27, 1981, Ser. No. 267,499
Int. Cl.³ G01S 7/28; H03K 5/01; H05H 7/02
U.S. Cl. 328—61 7 Claims



1. A radio frequency storage pulser for converting a continous wave radio frequency input into a pulsed radio frequency output comprising:
(a) separation means having first, second, third, and fourth ports, for transferring energy from said first port to said third and fourth ports during a first interval of a cycle and from said third and fourth ports to said second port during a second interval of a cycle;
(b) phase shifting means coupled between said input and said first port for providing a signal at said first port and for changing the phase of the signal at said first port by 180° in response to a first control signal;
(c) first and second radio frequency storage devices coupled to said second port and third port, respectively;
(d) first and second Q_e switch means for varying the coupling between said first and second radio frequency storage devices and said separation means in response to a second control signal; and
(e) modulation means operatively coupled to said phase shift keyer and to said first and second Q_e switch means for synchronously providing said first control signal to said phase shifting means and said second control signal to said first and second Q_e switch means so that said first and second radio frequency storage devices accept energy during said first interval and deliver energy during said second interval;
whereby the output produced at said fourth port is a series of pulses of duration and period corresponding to said first

and second intervals, the average power of said pulses being nearly as great as that of said input and the peak power of said pulses being substantially greater than that of said input.

4,467,285

PULSE MONITOR CIRCUIT

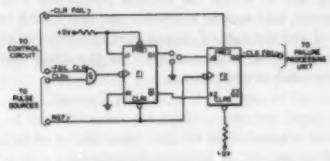
Gerald M. Rinaldi, Mundelein, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 21, 1981, Ser. No. 333,238

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ H03K *5/26*

U.S. Cl. 328—112 **17 Claims**



1. A pulse monitor circuit for use in a switching system, inluding a source of reference signal pulses having first and second polarities and a clock signal source normally operated to provide clock signal pulses with first and second edges, and abnormally operated to produce a clock signal pulse without said first or second edges, said pulse monitor circuit comprising:

first detection means connected to said clock signal source and said reference signal source, operated in response to a reference signal pulse of said first polarity and an absence of said first edge of a clock signal pulse to provide a first failure detected signal;

said first detection means further operated in response to a reference signal pulse of said second polarity to clear said first failure detected signal; and

first storage means connected to said first detection means and to said reference signal source, operated in response to said reference signal pulse of second polarity and said first failure detected signal to provide a first clock failure signal.

4,467,286

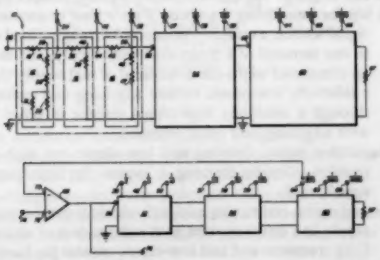
RESISTOR LADDER NETWORK

Robert M. Stitt, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Nov. 8, 1982, Ser. No. 439,944

Int. Cl.³ H03G *3/02*

U.S. Cl. 330—86 **26 Claims**



1. A cascadable prototype network section selectively adapted for a termination by a termination resistor and for connection in cascade with at least one other cascadable prototype network section terminated by said termination resistor, comprising:

first attenuation means for providing one half of a voltage applied to said network section;

second attenuation means, connected to said first means, for providing one fifth of said voltage; and

third attenuation means, connected to said second means, for providing one tenth of said voltage, said first second and third means are made from resistors of substantially one value, and said first means is comprised of three resistors connected in series with a parallel combination of two resistors.

4,467,287

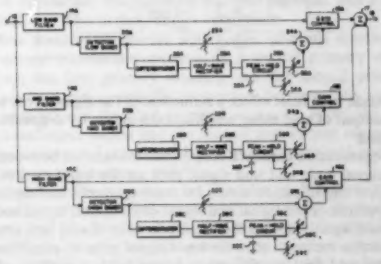
SIGNAL EXPANDER

Joseph R. Aylward, Plymouth, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Jun. 4, 1982, Ser. No. 385,054

Int. Cl.³ H03F *3/68*

U.S. Cl. 330—126 **12 Claims**



1. A signal conditioning system for modifying the dynamic range of an electrical input signal, said system comprising:

gain control means for controlling the gain of said input signal as a function of a gain control signal;

control signal generating means for generating said gain control signal, said control signal generating means comprising:

(1) means for generating a first signal as a function of the amplitude of the input signal, and

(2) means responsive to said first signal for generating said gain control signal as a function of at least a portion of only one polarity of the time derivative of said first signal, said means for generating said gain control signal comprising:

(a) at least two signal transmission paths, the first of said paths for transmitting said first signal, and the second of said paths including (i) signal differentiator means for generating a second signal as a function of the time derivative of said first and (ii) rectification means for rectifying said second signal, and

(b) signal summing means for providing said control signal as a function of the addition of the signals transmitted over said two paths.

4,467,288

DISTORTION-FREE COMPLEMENTED ERROR FEEDBACK AMPLIFIER AND METHOD

James C. Strickland, 1595 NE. 175 St., N. Miami Beach, Fla. 33162

Filed Jan. 5, 1982, Ser. No. 337,290

Int. Cl.³ H03F *1/26, 1/34*

U.S. Cl. 330—149 **16 Claims**

1. An amplifier for amplifying an electric signal, said amplifier comprising:

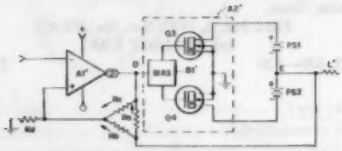
a signal path extending between an input port and an output port;

a signal node in said signal path between said input and said output port;

first amplification means in said signal path connected between said input port and said signal node for amplifying an input signal applied to said input port and for providing the so-amplified signal to said signal node;

another amplification means in said signal path connected between said signal node and said output port for amplifying a signal from said signal node, said other amplification means providing the so-amplified signal and any signal error introduced by said other amplification means to said output port;

a degenerative feedback loop means connected between said signal path on the output port side of said other amplification means and said signal node for degeneratively feeding back a portion of the signal amplified by said other amplification means and any introduced signal error to said signal node for combination with the signal at said signal



node to at least effect a reduction in the signal error at the output of said other amplification means by degeneration; and

a regenerative feedback loop means connected between said signal node and said signal path on the input port side of first amplification means for regeneratively feeding back a portion of the signal and signal error at said signal node to said signal path on the input port side of said first amplification means to alter the input signal prior to amplification by said first amplification means with a portion of the signal error introduced by said other amplification means present at said signal node,

whereby the so-altered input signal is effective to at least cause a reduction in the signal error at the output port as the so-altered input signal is propagated along the signal path to the output port.

4,467,289

CURRENT MIRROR CIRCUIT

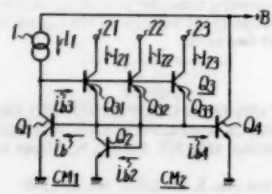
Takashi Okada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 203,978, Nov. 4, 1980, abandoned. This application May 2, 1983, Ser. No. 480,417

Claims priority, application Japan, Nov. 5, 1979, 54-143025; Nov. 5, 1979, 54-143026; Feb. 26, 1980, 55-23247; Feb. 29, 1980, 55-25544

Int. Cl.³ H03F 3/04

U.S. Cl. 330—288 **15 Claims**



1. A current mirror circuit comprising: a power supply source, a series circuit of a current source and the collector-emitter path of a first transistor, said series circuit being connected between said power supply source and a reference voltage source, and a second transistor circuit having a control electrode connected with the base of said first transistor and a main current path connected between the base of said first transistor and said reference voltage source, characterized by: a third transistor circuit having a control electrode connected with the collector of said first transistor and a main current path one terminal of which is connected with the base of said first transistor; and a fourth transistor circuit having a control electrode connected with the base of said first transistor and a main current path one terminal of which is connected with said reference voltage source, in which the other terminal of said main current path of said fourth transistor is connected with said power supply source, in which said third transistor circuit consists of a plurality of transistors which have their control electrodes and one of their main current path electrodes respectively connected together and a plurality of output terminals connected respectively to the other main current path electrodes, and in which the current proportion among said first transistor, said second transistor and said fourth transistor is $1:n:n^2-1$ and the sum of output currents obtained from said output terminals in n times as great as the input current obtained from said current source.

4,467,290

SIGNAL AMPLIFIER WITH WIDE LINEAR DYNAMIC RANGE

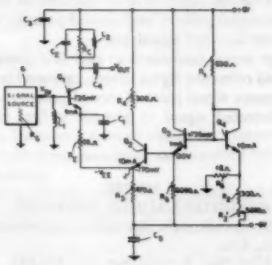
Gianfranco Cozzi, Rome, Italy, assignor to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed May 28, 1982, Ser. No. 383,124

Claims priority, application Italy, May 29, 1981, 48580 A/81

Int. Cl.³ H03F 1/30, 3/04

U.S. Cl. 330—290 **6 Claims**



1. An amplifier for high-frequency signals, comprising:

a bipolar amplifying transistor with a base connected to a signal source, a collector connected through a load circuit to one terminal of a direct-currently supply, and an emitter connected to the other terminal of said supply through a relatively low-ohmic resistor adjoining said emitter and through a relatively high-ohmic resistor in series therewith adjoining said other terminal;

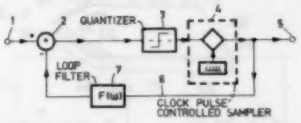
capacitive means shunting said low-ohmic and high-ohmic resistors, thereby forming a bypass for high-frequency signals; and

circuit means connecting said high-ohmic resistor across said supply in a direct-current path independent of said amplifying transistor and said low-ohmic resistor for biasing the junction of said resistors to an intermediate potential between those of said terminals for maintaining a substantially constant mean voltage drop across said low-ohmic resistor.

4,467,291
DELTA MODULATOR HAVING OPTIMIZED LOOP FILTER

Engel Roza, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,232
Int. Cl.³ H03K 13/22
U.S. Cl. 332—11 D 3 Claims

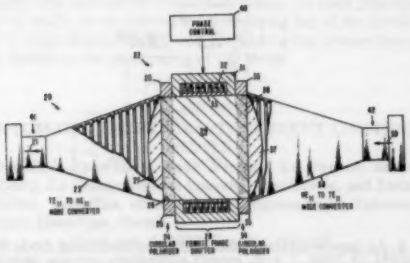


1. In a delta modulator comprising a feedback loop incorporating a cascade arrangement formed by a difference producer, a loop filter, a two-level quantizer, a clock pulse controlled sampler and a feedback path from the output of the sampler to an input of the difference producer to another input of which the signal to be coded is applied, the improvement wherein the loop filter is a minimum-phase network having such a phase characteristic that phase shift in the feedback loop caused by the frequency-independent time delay of the sampler is restored to approximately 180° with a certain margin (m), in the frequency range having an upper side which is limited by the lowest frequency of the frequencies $\omega=\pi/\tau$ and $\omega=\pi/T$, wherein τ represents the frequency-independent time delay of the sampler and T represents the sampling period, the phase of the loop filter being constant above the upper side of the frequency range.

4,467,292
MILLIMETER-WAVE PHASE SHIFTING DEVICE

James S. Ajioka, and Raymond Tang, both of Fullerton, Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 30, 1982, Ser. No. 431,975
Int. Cl.³ H01P 1/19
U.S. Cl. 333—24.1 9 Claims



1. A millimeter-wave phase shifter comprising:

first means for expanding the energy cross-section of applied dominant TE_{11} mode linearly polarized energy and converting it to circularly polarized HE_{11} mode energy;

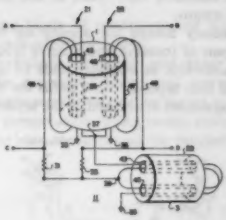
phase shifting means for introducing a controlled amount of phase shift into the circularly polarized HE_{11} mode energy; and

second means for contracting the energy cross-section of the phase shifted circularly polarized HE_{11} mode energy and converting it to linearly polarized dominant TE_{11} mode energy.

4,467,293
FERRITE TYPE DIRECTIONAL COUPLER

Thomas R. Apel, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 18, 1981, Ser. No. 303,449
Int. Cl.³ H03H 7/00
U.S. Cl. 333—112 10 Claims



1. A directional coupler with a source terminal, and a load terminal, the directional coupler comprises:

a first transformer means with a first primary winding, a second transformer means with a second primary winding, the first primary winding and the second primary winding being serially connected between the source terminal and the load terminal at a node point, the first transformer means and the second transformer means for providing an I sample of the current flow through the first and second primary winding;

a third transformer means for providing a V sample of the voltage that causes the current flow through the first and second primary windings, the third transformer means includes an auto transformer with an input terminal connected to the node point, an output tap, and a reference terminal connected to a reference point; and

vector adder means for vectorially combining the I sample and the V sample to obtain a first signal representative of the reflected power components of the I sample and the V sample and to provide a second signal representative of the forward power components of the I sample and the V sample.

4,467,294
WAVEGUIDE APPARATUS AND METHOD FOR DUAL POLARIZED AND DUAL FREQUENCY SIGNALS

James M. Janky, and Albert L. Horley, both of Mountain View, Calif., assignors to Vitalink Communications Corporation, Mountain View, Calif.

Filed Dec. 17, 1981, Ser. No. 331,727
Int. Cl.³ H01P 1/161, 5/16
U.S. Cl. 333—126 22 Claims

1. A waveguide apparatus for guiding a first pair of horizontally polarized transmit and receive frequencies independently of and in electrical parallel with a second pair of vertically polarized transmit and receive frequencies between a feed horn and related transmitter or receiver units,

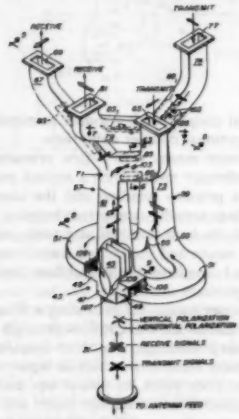
said waveguide apparatus being constructed to operate across the 4 to 6 GigaHertz band with a very narrow bandwidth for the transmit frequency and a very narrow bandwidth for the receive frequency and with a single size of rectangular waveguide for separating the transmit and receive frequencies,

said waveguide apparatus comprising,

polarization junction means connectable to an end of the feed horn and effective to separate the horizontally polarized receive frequency from the vertically polarized receive frequency as the receive frequencies flow from the horn toward the receive units and effective to guide the separated horizontally and vertically polarized transmit frequencies into joint flow through the common feed horn to the antenna,

first frequency separating means for separating the vertically polarized pair of transmit and receive frequencies of very narrow bandwidth at opposite ends of the 4 to 6 Giga-Hertz band into separate flow paths for the transmit and receive frequencies at one end of the separating means and effective to maintain electrical isolation between the associated transmitter and receiver units while guiding the frequencies to and from the polarization junction means through a common flow path at the other end of the separating means,

second frequency means for separating the horizontally polarized pair of transmit and receive frequencies of very narrow bandwidth at opposite ends of the 4 to 6 Giga-Hertz band into separate flow paths for the transmit and receive frequencies at one end of the separating means and



effective to maintain electrical isolation between the associated transmitter and receiver units while guiding the frequencies to and from the polarization junction means through a common flow path at the other end of the separating means, and

wherein the separate flow paths for the transmit and receive frequencies in the first and second frequency separating means are rectangular and have the same internal height and width dimensions so that a single size of waveguide separates the transmit and receive frequencies, and

coupling means connected between the polarization junction means and the second frequency separating means for guiding the horizontally polarized transmit and receive frequencies between the second frequency separating means and the polarization junction means.

4,467,295

SOLID ULTRASONIC DELAY LINE

Takeo Yokoyama, Ebina; Ichiya Imai, Ayase, and Hideaki Asaoka, Sagamihara, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kanagawa, Japan

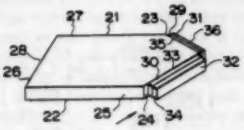
Filed Sep. 27, 1982, Ser. No. 424,494

Claims priority, application Japan, Nov. 25, 1981, 56-188635; Apr. 30, 1982, 57-73836; Apr. 30, 1982, 57-73837

Int. Cl.³ H03H *9/36, 9/13*

U.S. Cl. 333—141 **11 Claims**

1. A solid ultrasonic delay line comprising a delay medium having two parallel major faces and at least three end faces intersecting said major faces, an input transducer bonded to one of said end faces and polarized in a direction parallel to said major faces for transmitting an ultrasonic signal in a shear mode into said delay medium, and an output transducer bonded to one of said end faces for converting said ultrasonic signal having propagated through said delay medium into an electrical signal, said input and output transducers having boundary surfaces lying flush with said two major faces of said delay medium, said major faces and said boundary surfaces being ground to a surface roughness which is one-twentieth or smaller of the wavelength of the ultrasonic signal propagating through said delay medium, said major faces sandwiching a path of the ultrasonic signal propagating through said delay



medium and being spaced from each other by a distance which is subjected to variations that are one-twentieth or smaller of the wavelength of the ultrasonic signal propagating through said delay medium, said distance ranging from greater than 5 times to 20 times the wavelength of the ultrasonic signal propagating through said delay medium.

4,467,296

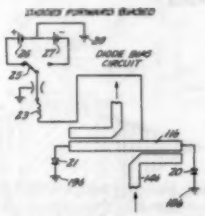
INTEGRATED ELECTRONIC CONTROLLED DIODE FILTER MICROWAVE NETWORKS

Morris Cohen, Oceanside, N.Y., and Leon M. Underkofler, Santa Clara, Calif., assignors to Loral Corporation, Yonkers, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,607

Int. Cl.³ H01P *1/20, 1/203, 1/205*

U.S. Cl. 333—202 **5 Claims**



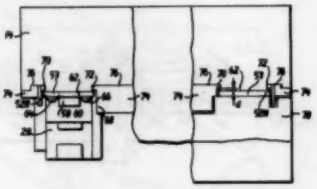
1. An improved integrated electronic controlled diode filter microwave network comprising: at least one pair of inductively coupled transmission lines, one of said lines transmitting a microwave signal, and the other of said lines being disposed adjacent said first line, said signal being induced in said second line; means including a diode for effectively grounding said second conductor when forwardly biased and effectively disconnecting said grounding connection when said diode is rearwardly biased, whereby said construction may serve different functions depending upon the state of bias of said diode and means for controlling the direction of bias of said diode including an rf choke, a switch, directional sources of current and a common ground; both said pair of transmission lines being connected through diodes to ground.

4,467,297

MULTI-POLE CIRCUIT BREAKER WITH INTERCHANGEABLE MAGNETO-THERMAL TRIPPING UNIT

Bernard Boichot-Castagne, Sassenage; Roger Case, Seyssinet-Pariset, and Jackie Pezelet, Uriage, all of France, assignors to Merlin Gerin, Grenoble Cedex, France

Filed Apr. 29, 1982, Ser. No. 373,142
Claims priority, application France, May 7, 1981, 81 09296
Int. Cl.³ H01H 73/06
U.S. Cl. 335—8 8 Claims



1. A multi-pole circuit breaker comprising a breaker unit having a molded insulating box and a plurality of pole units supported within said box, and a magneto-thermal tripping unit interchangeable according to the selected rating and including a molded insulating box which is mounted to rest on the box of the breaker unit, each pole unit of the breaker unit comprising a stationary contact and a movable contact, an upstream connection terminal of the circuit breaker connected to the stationary contact and a connecting lug connected through an electrical connection to the movable contact, said tripping unit comprising, for each of said pole units, thermal and electromagnetic trip means to operate upon the occurrence of certain current conditions for effecting tripping of the circuit breaker, a downstream connection terminal of the circuit breaker and a connecting lug, said trip means being connected in series between the downstream connection terminal and the connecting lug, wherein the connecting lug of the breaker unit is positioned with play within the box of the breaker unit, the electrical connection between the movable contact and the connecting lug being flexible to allow shifting of the connecting lug relative to the box, the connecting lug of the breaker unit and the connecting lug of the tripping unit being superimposed in the mounted position of the tripping unit box on the box of the breaker unit, said circuit breaker including, for each pole unit, a connecting screw shifting the connecting lug of the breaker unit to bear on the tripping unit connecting lug irrespective of any defects in the positioning of the boxes.

4,467,298

AUTOMATIC SHORT-CIRCUIT CURRENT LIMITING DEVICE

Elie Belbel, Vaucresson; Louis Féchant, Le Vesinet; André Haury, Le Raincy; Michel Lauraire, Courbevoie, and Lucien Siffroi, Versailles, all of France, assignors to La Telemecanique Electrique, France

Filed Aug. 6, 1982, Ser. No. 405,829
Claims priority, application France, Aug. 7, 1981, 81 15573
Int. Cl.³ H01H 77/10
U.S. Cl. 335—16 8 Claims

1. A current limiting circuit breaker comprising:

a. an insulating case having a base member, a plane of symmetry substantially at right angles with the said base;

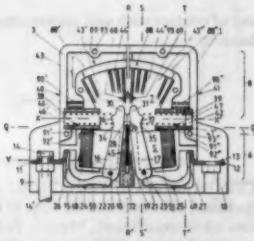
b. first and second levers pivotably mounted in a first inner volume portion of the case, about pivot means substantially parallel to said plane of symmetry, the pivot means and the lever being symmetrically arranged with respect to the said plane of symmetry, the lever having pivoting ends and opposite ends, the pivoting ends being located nearer from the base member than the opposite ends;

c. first and second contact members mounted facing to each other at the respective opposite ends of the first and second levers;

d. first and second spring means mounted within the casing and each having a fixed end and an opposite end, the opposite ends of the spring means bearing on the respective opposite ends on the levers, the levers and the contact members being repelled from each other against the action of the spring means for a predetermined value of over-current;

e. an insulating blade of predetermined width, said blade having lower and upper edges;

f. means for slidably mounting said blade in said casing between the respective levers and providing electrical insulation between the respective levers in any position of said blade; compression spring means mounted in the case between the base member and the insulating blade;



g. an arc chute having a plurality of fins symmetrically arranged with respect to the plane of symmetry in a second inner volume portion of the case which is farther from the base member than the first volume portion, said plurality comprising two fins forming a gap therebetween about the said plane of symmetry in the extension of said blade;

locking means integrally movable with at least one lever and adapted, when the contact members are in mutual engagement, to lock the insulating blade into a rest position in which the upper edge of the blade is located in close proximity to the contact members, said locking means being adapted for releasing the blade when the contact members are separated by a minimal distance which equals the width of the blade, the blade then being moved by the compression spring means to an actuated position in which the said upper edge is engaged into the said gap.

4,467,299

ADAPTER ASSEMBLY FOR CIRCUIT BREAKER UNDERVOLTAGE RELEASE ACCESSORY

Edwin J. Collin, Southington, and Charles L. Jencks, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.

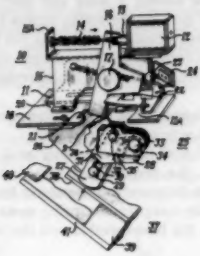
Filed Dec. 3, 1982, Ser. No. 446,808
Int. Cl.³ H01H 83/12
U.S. Cl. 335—20 3 Claims

1. An adapter for a circuit breaker undervoltage release accessory of the type consisting of a tripping mechanism for causing an operating mechanism within the breaker to open the breaker contacts upon the occurrence of an undervoltage condition comprising:

an operating lever pivotally attached to a support proximate said undervoltage release accessory for interfering with the tripping mechanism of said undervoltage release accessory to prevent said tripping mechanism from operating when the breaker contacts are already open; and

a slide means attached to said support by means of a pin on said support captured within a slot in said slide at one end and attached to said operating lever at an opposite end, said slide means being operatively arranged between said operating lever and said breaker operating mechanism for

contacting a portion of the circuit breaker operating mechanism to operatively move said operating lever in



and out of contact with said undervoltage release tripping mechanism.

4,467,300

ELECTROMAGNETIC SWITCHING APPARATUS

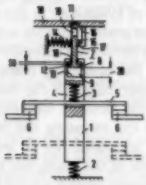
Werner Harbauer, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,058

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117914

Int. Cl.³ H01H *51/08*

U.S. Cl. 335—131 **9 Claims**



1. In electromagnetic switching apparatus including a movable contact carrier movable in one direction toward an open switch condition of the apparatus and in another direction toward a closed switch condition of the apparatus, and a switch position indicator coupled thereto, the improvement comprising means for coupling the switch position indicator to the movable contact carrier such that the switch position indicator can travel a distance greater than the distance travelled by the contact carrier when the contact carrier is moved from at least one of the switch conditions of the switching apparatus to the other switch condition, said means in at least one of the switch conditions coupling the switch position indicator to the contact carrier with limited free play between the switch position indicator and the contact carrier in both directions of movement of the contact carrier such that the coupling between the switch position indicator and the contact carrier takes place at one end of the free play only after the contact carrier has moved a predetermined distance, said means including a toggle mechanism coupled to the switch position indicator which moves the switch position indicator after the contact carrier moves further than said predetermined distance, the overall distance which the switch position indicator is moved by the contact carrier and by the toggle mechanism being greater than the distance moved by the contact carrier.

4,467,301

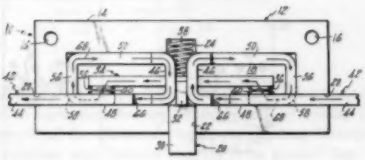
ELECTRIC SWITCH HAVING ENHANCED FAULT CURRENT CAPABILITY

Ronald W. Goodrich, Logansport, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Aug. 27, 1982, Ser. No. 412,316

Int. Cl.³ H01H *79/00*

U.S. Cl. 335—195 **6 Claims**



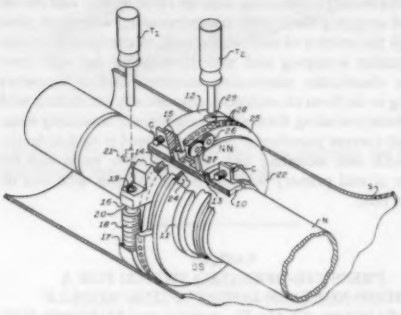
1. An electric switch comprising: support means; first and second rigid stationary terminal elements mounted on said support means in a spaced relationship; first and second fixed contacts supported respectively on said first and second terminal elements; an elongated bridging contact member comprising a flat conductive blade having a contact portion at each of the two opposite ends thereof; a contact actuator mounted for generally rectilinear movement relative to said support means and supporting said bridging contact member for generally rectilinear movement therewith; said contact actuator being movable rectilinearly to move said bridging contact member toward said fixed contacts to a closed position in engagement with said fixed contacts and away from said fixed contacts to an open position spaced from said fixed contacts; resilient means backing said bridging contact member on said contact actuator and urging said bridging contact member against said fixed contacts to provide a predetermined normal pressure between said contact portions and fixed contacts in the closed position of said bridging contact member; at least one of said terminal elements comprising an elongated strip of sheet metal folded back upon itself to define a bight and closely spaced first and second sections extending from said bight in generally parallel relation; said first section being provided with a longitudinal opening therein spaced from said bight; an integral arm section extending angularly from the distal end of said second section toward said first section and terminating in an extension disposed in said opening in said first section; said extension lying substantially in the plane of said first section but in completely spaced relation to said first section; one of said fixed contacts being secured to said at least one terminal element at the surface of said extension which faces said second section; at least part of said bridging contact member extending between said first and second sections in closely spaced and axially parallel relation thereto but rectilinearly movable therebetween; and said at least one terminal element being provided with electrical connections means at the distal end of said first section for connecting the electric switch in an electric circuit; the current flow through said bridging contact member and the current flow through said first section being in like directions opposite to the direction of current flow through said second section whereby on occurrence of a fault current condition in the electric circuit including the electric switch a repulsive force is developed between said bridging contact member and said second section and an attractive force is developed between said bridging contact member and said first section which urge said bridging contact member toward said fixed contacts.

4,467,302

CRT COLOR PURITY ADJUSTMENT APPARATUS

Warren R. Lang, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 24, 1983, Ser. No. 478,422
Int. Cl.³ H01F 1/00
U.S. Cl. 335—212 7 Claims



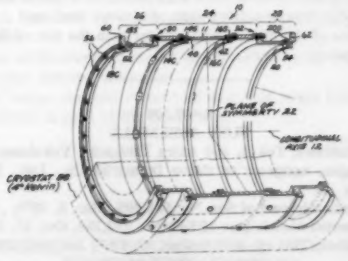
1. A color purity adjustment apparatus for a cathode ray tube comprising:
a base member fixedly secured to the neck of said tube,
a sleeve member rotataby supported on said base member,
a first ring magnet supported in and fixedly secured to said sleeve member for rotation relative to said base member,
a second ring magnet rotatably supported on said sleeve member for rotation relative to said base member, and
a differential gearing mechanism interconnecting said sleeve member and said first and second ring magnets for providing relative rotation of said ring magnets simultaneously in opposite directions in one mode of operation and simultaneously in like directions in another mode of operation.

4,467,303

SUPERCONDUCTING MAGNET HAVING A SUPPORT STRUCTURE FOR RING-SHAPED SUPERCONDUCTIVE COILS

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,706
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 19 Claims



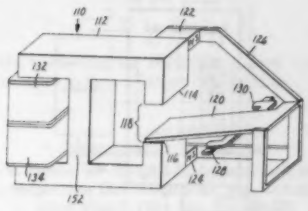
1. A superconducting magnet comprising:
at least one ring-shaped superconductive coil; and
a support structure for said coil including a body formed of a generally-cylindrical wall, said body having a first inwardly-facing surface which is of a generally-cylindrical shape and which is adapted to abut the radially-outer surface of said coil;
said body comprising a material adapted to shrink around said coil as said coil and said body are cooled to a cryogenic temperature so as to provide an inteference fit between said coil and said body.

4,467,304

SATURABLE TANDEM COIL TRANSFORMER RELAY

Daniel E. Reisem, Maplewood, Minn., assignor to Minnesota Mining and Manfacturing Company, St. Paul, Minn.

Filed Dec. 28, 1982, Ser. No. 453,947
Int. Cl.³ H01F 7/08
U.S. Cl. 335—227 27 Claims



1. An electromagnetic device, comprising:
a ferromagnetic core having first and second legs and a third leg wherein opposed pole faces define a gap;
an armature mounted in said electromagnetic device for selective contact with either of said pole faces;
a source of latching flux cooperating with said ferromagnetic core and said armature for retaining said armature against either of said pole faces;
a primary source of flux cooperating with said ferromagnetic core for inducing a primary flux in said first leg; and
a secondary source of flux cooperating with said ferromagnetic core for selectively inhibiting said primary flux in said first leg in one direction with respect to said first leg;
said second leg being saturable under the cumulative flux created by said primary flux induced by said primary source of flux while said secondary source of flux selectively inhibits said primary flux in said one direction;
whereby said armature is retained in contact with one of said pole faces until said second leg saturates under said cumulative flux created by said primary flux induced by said primary source of flux while said secondary source of flux inhibits said primary flux in said one direction transferring a portion of said cumulative flux from said second leg to said third leg operatively moving said armature to a selected one of said pole faces.

4,467,305

GAS/VAPOR COOLED ELECTROMAGNETIC INDUCTION MACHINE

Nobuyoshi Ando, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

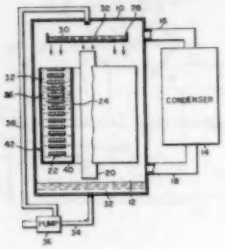
Filed Sep. 30, 1982, Ser. No. 431,084
Claims priority, application Japan, Oct. 12, 1981, 56-162249
Int. Cl.³ H01F 27/08
U.S. Cl. 336—55 1 Claim

1. A gas/vapor cooled electromagnetic induction machine comprising:
an enclosed tank having an amount of an electrically insulating gas charged into said enclosed tank and non-condensable at operating temperatures and under operating pressures, and also having an amount of a cooling gas charged in said enclosed tank and condensable at the operating temperatures and under the operating pressures,
a condenser connected to said enclosed tank to condense said cooling gas into a condensate,
an iron core disposed within said enclosed tank,
a coil assembly wound around said iron core,

a dripping pan means, located in the upper portion of the enclosed tank, for dropping said condensate on said coil assembly and said iron core,

a pump means for supplying said condensate to said dripping pan, and

a container having a pair of electrically insulating cylinders disposed around an inner and an outer periphery of said coil assembly and also having a bottom plate means for collecting said condensate dropped from said dripping pan within the enclosed tank,



whereby the coil assembly is always partly or entirely immersed in the condensate collected in the container, thus improving the conduction of heat generated on the coil assembly and resulting in the efficient cooling of the coil assembly through the removal of a latent heat of vaporization of the condensate therefrom and also resulting in preventing the coil assembly from rising locally in temperature.

4,467,306

HIGH VOLTAGE CURRENT TRANSFORMER HAVING COILS IMMERSED IN DIELECTRIC FLUID

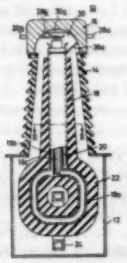
Hikozo Morishita, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,053

Claims priority, application Japan, Dec. 23, 1981, 56-192021[U]

Int. Cl.³ H01F *27/10*

U.S. Cl. 336—58 **3 Claims**



1. A current transformer comprising a housing, an amount of a dielectric fluid disposed in said housing, a primary winding in the form of a tubular electrically conducting coil including a single turn, an outer tubular electrically conducting member having an outer member end connected at said outer member end to one end of said coil and communicating with the interior thereof, an inner electrically conducting member different in cross-sectional profile from said outer tubular electrically conducting member and coaxially disposed within said outer tubular electrically conducting member, connected at said outer member end to the other end of said coil, a hollow cylindrical dielectric member coaxially disposed within and radially spaced from said outer tubular electrically conducting member to surround said inner electrically conducting member in radially spaced relation thereto to form an incoming flow path for said dielectric fluid between said outer tubular electrically conducting member and said hollow cylindrical dielectric member and an outgoing flowing path for said dielectric fluid between said hollow cylindrical dielectric member and said inner electrically conducting member respectively, said incoming and outgoing flow paths communicating with each other through the interior of said tubular coil, an electrically insulating member wrapping said primary winding and said outer tubular electrically conducting member, and a secondary winding in the form of a solenoid magnetically interlinked with said primary winding through said electrically insulating member, said current transformer being immersed in said dielectric fluid with said incoming and outgoing flow paths and the interior of said primary winding being charged with said dielectric fluid.

4,467,307

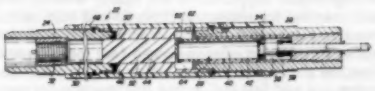
PRESSURE-OPERATED SWITCH FOR A HIGH-VOLTAGE INTERRUPTING MODULE

Hiram S. Jackson, Skokie, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Aug. 17, 1983, Ser. No. 524,181

Int. Cl.³ H01H *39/00*

U.S. Cl. 337—30 **17 Claims**



1. An improved switch for a high-voltage device; the switch being of the type in which ignition of a power cartridge moves an insulative piston, which is normally located in a bore formed in a conductive member, away therefrom and into a passageway formed in an insulative liner, such movement of the piston moving a movable contact through the passageway and away from the conductive member to break an electrical interconnection between the conductive member and the movable contact and to form a gap therebetween, thereby opening the switch; the bore and the passageway being aligned; wherein the improvement comprises:

the piston being made of a material which is more rigid and less easy to deform than the material of the liner upon the application, at a given rate, of a given load, and

the size of the piston being greater than the size of the passageway.

4,467,308

FUSE ASSEMBLY

Hiroo Arikawa, Tokyo, and Akira Taniguchi, Yokohama, both of Japan, assignors to San-o Industrial Co., Ltd., Tokyo, Japan

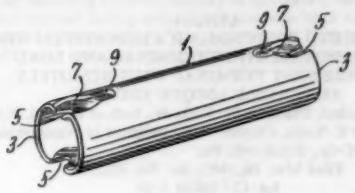
Continuation-in-part of Ser. No. 884,595, Mar. 8, 1978, , which is a continuation-in-part of Ser. No. 732,183, Oct. 13, 1976, abandoned. This application Jan. 19, 1981, Ser. No. 226,370

Int. Cl.³ H01H *85/16*

U.S. Cl. 337—231 **1 Claim**

1. A fuse assembly comprising a rigid tubular member having rims at its opposite ends wherein each of said rims has; a preformed generally gourd-shaped recessed area defined by a notch and a groove disposed on the exterior surface of said rigid tubular member at each end thereof; a fusible element stretched between the ends of said rigid tubular member, the ends of said fusible element being securely positioned within said respective preformed notches and bent thereover to the

exterior surface of said rigid tubular member and embedded into said grooves of said generally gourd-shaped recess and



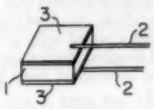
secured therein by solder, and end caps enclosing the ends of said tubular member and said recesses.

4,467,309

HIGH TEMPERATURE THERMISTOR

Yasuo Matsushita; Kousuke Nakamura, and Mitsuru Ura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,571
Claims priority, application Japan, Apr. 30, 1981, 56-64151
Int. Cl.³ H01C 7/04
U.S. Cl. 338—22 R **7 Claims**



1. A high-temperature thermistor comprising:

a polycrystalline sintered body consisting essentially of 0.1–8 weight percent of at least one kind selected from the group consisting of Be, BeO, Be_2C, B, BN, B_2O_3 and B_4C, which weight percent is calculated as the amount of only Be or B single substance from net amount, the balance SiC, and the inevitable impurities having not more than 2 weight percent of SiO_2, not more than 0.1 weight percent of Al, not more than 0.2 weight percent of Fe, not more than 1 weight percent of Si, and not more than 0.4 weight percent of free carbon, said sintered body having an electric resistivity of not less than $10^7\Omega$-cm at room temperature,

a pair of electrodes provided on the surfaces of the polycrystalline sintered body, and

lead wires, one end of each of said lead wires being connected to each of the electrodes.

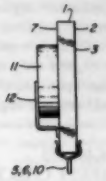
4,467,310

TELEPHONE SUBSCRIBER LINE BATTERY FEED RESISTOR ARRANGEMENTS

Gyula Jakab, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 3, 1983, Ser. No. 538,771
Int. Cl.³ H01C 7/10; H02H 5/04
U.S. Cl. 338—22 R **14 Claims**

1. A telephone subscriber line battery feed resistor arrangement comprising an insulator, a thick film resistor on one side of the insulator, a positive temperature coefficient (PTC) resistor on another side of the insulator opposite the thick film resistor whereby the thick film resistor and the PTC resistor are thermally coupled together via the insulator, and means



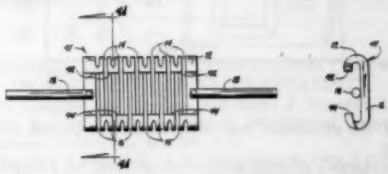
electrically connecting the thick film resistor and the PTC resistor in series to form a battery feed resistor.

4,467,311

ELECTRICAL RESISTOR

Herman R. Person, and Douglas E. Johnson, both of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed May 2, 1983, Ser. No. 490,853
Int. Cl.³ H01C 3/12
U.S. Cl. 338—293 **6 Claims**



1. A high power, low resistance electrical resistor made by the process comprising:

attaching a pair of electrical leads to the opposite ends of a flat metal plate having a thickness of from 8 mils to 50 mils and having opposite lateral edges extending between said opposite ends, the thickness of said plate being sufficient to permit said plate to be self-supporting;

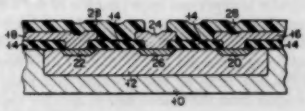
using a laser beam to cut completely through the thickness of said plate so as to form staggered and inwardly extending notches in said side edges of said plate to increase the effective electrical resistance of said plate, said laser beam at the same time annealing said metal of said metal plate so that the electrical characteristics of said metal plate are stable after said notches have been cut.

4,467,312

SEMICONDUCTOR RESISTOR DEVICE

Shigeru Komatsu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 24, 1981, Ser. No. 324,954
Claims priority, application Japan, Dec. 23, 1980, 55-191320
Int. Cl.³ H01C 7/012
U.S. Cl. 338—309 **8 Claims**



1. A semiconductor resistor device which comprises:

a semiconductor substrate;

a semiconductor resistor region formed near the surface area

of said semiconductor substrate, said resistor region including alloyed contact regions;

conductive electrodes each ohmically in contact with the surface of said semiconductor region only at individual ones of said alloyed contact regions; and

a trimming electrode ohmically in contact with the surface of said semiconductor region only at another of said alloyed contact regions between said electrodes for decreasing the resistance of said resistor regions.

4,467,313

AUTOMOTIVE REAR SAFETY CHECKING APPARATUS

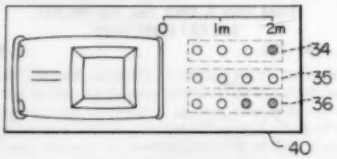
Yasuhisa Yoshino; Masao Kodera, both of Okazaki; Hajime Ito, Aichi, and Hisatoshi Ohta, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 12, 1981, Ser. No. 320,568

Claims priority, application Japan, Nov. 14, 1980, 55-163688; Dec. 18, 1980, 55-182277

Int. Cl.³ G08G *1/00*; G08B *13/16*

U.S. Cl. 340—904 9 Claims



1. An automotive rear safety checking apparatus comprising:

a plurality of obstacle detectors provided for a corresponding plurality of watch areas made by dividing a rear area of the automobile into plural parts, each of said obstacle detectors emitting an ultrasonic wave to the corresponding watch area and receiving reflected waves from obstacles which exist in the area,

control means for carrying out an obstacle detecting operation periodically and repeatedly, said obstacle detecting operation including activating said obstacle detectors successively in time division mode, causing the activated obstacle detector to emit an ultrasonic wave, determining whether said obstacle detector receives a reflected wave from an obstacle in the rear of the automobile after the emission of the reflected wave, and generating a distance signal, which corresponds to relative distance between the automobile and said obstacle, from the time between emission of the ultrasonic wave and receipt of a reflected wave from said obstacle, together with a position signal which corresponds to the activated obstacle detector,

means for storing the distance signals which correspond to the position signals respectively,

alarm sound generator means for generating an alarm sound which is proportionally varied in its rate of repetition to represent the distance of the shortest distance signal in the stored distance signals, and

indication means including optical alarm elements arranged two-dimensionally such that said elements are arranged in one direction to represent each position of the watch area, and in another direction to represent the distance between each watch area and a detected obstacle, said optical elements being arranged in said another direction as positions extending from an end position indicating the farthest location from the automobile to another end position indicating the nearest location to the automobile, said optical elements being activated by the distance signal stored in said storing means such that the shorter the distance between the automobile and the obstacle, the more the optical elements are activated from the optical element at said end position toward the optical element at said another end position.

4,467,314

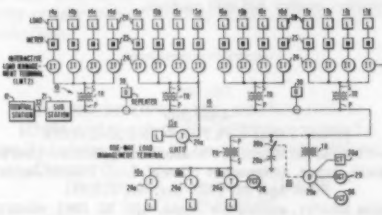
ELECTRIC UTILITY COMMUNICATION SYSTEM WITH FIELD INSTALLATION TERMINAL AND LOAD MANAGEMENT TERMINAL WITH REMOTELY ASSIGNABLE UNIQUE ADDRESS

Scott J. Weikel; Theodore H. York, Jr., both of Raleigh, N.C., and Carl E. Yates, Chester, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1982, Ser. No. 363,218

Int. Cl.³ H04B *3/54*

U.S. Cl. 340—310 A 10 Claims



1. Distribution powerline carrier communication apparatus comprising:

a load management terminal connected to the powerline and deriving power therefrom, said load management terminal comprising a receiver coupled to the powerline for receiving a carrier signal imposed thereon and means connected to said receiver for controlling loads in response to said carrier signals, and

a test terminal removably connected to said load management terminal and deriving operating power therefrom, said test terminal comprising a test transmitter coupled to the powerline for imposing carrier signals on the powerline, and means connected to said test transmitter for generating test commands to actuate said load control means and for modulating said commands onto carrier signals imposed on the powerline by said test transmitter, whereby said commands are transmitted from said test terminal to said load management terminal solely over the powerline and are received by said receiver to cause actuation of said load control means.

4,467,315

DIGITAL COMPANDOR HAVING NONLINEAR COMPANDING CHARACTERISTICS

Rikio Maruta, and Atsushi Tomozawa, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1978, Ser. No. 934,985

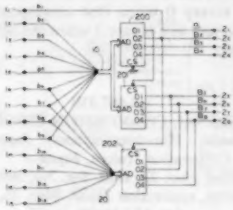
Claims priority, application Japan, Aug. 22, 1977, 52-100927

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD 1 Claim

1. A digital compandor for converting a linear code signal into a nonlinear code signal, said linear code signal including a polarity bit which represents the polarity of each sample value of an original analog signal and a plurality of absolute value bits which represent the absolute value of the sample, said nonlinear code signal including said polarity bit, a plurality of segment bits which identify one of a plurality of segments to which said sample value of the original analog signal belongs and mantissa bits which are indicative of the position of said sample value in said identified segment, said compandor comprising: a plurality of input terminal means for receiving said linear code signal; a first read-only memory means which is addressable by a first bit group including a predetermined plurality of bits among said absolute value bits for memorizing

a segment bit decision rule by which said segment bits are determined responsive to said first bit group; a second read-only memory means which is addressable by a second bit group including another plurality of bits among said absolute value bits and having some bits in common with said first bit group for memorizing a first mantissa bit decision rule by which said mantissa bits are determined responsive to said



second bit group; a third read-only memory means addressable by said first bit group for memorizing a second mantissa bit decision rule by which mantissa bits are determined responsive to said first bit group; and means for selecting said second or third read-only memory means responsive to the value of the most significant bit among the segment bits supplied by said first read-only memory means.

4,467,316

GENERALIZED INTERPOLATIVE METHOD FOR DIGITAL/ANALOG CONVERSION OF PCM SIGNALS

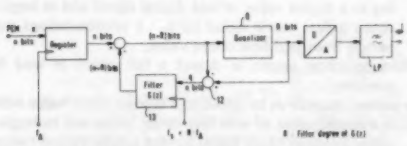
Hans-Georg Musmann, Salzgitter-Bad, and Wilhelm W. Korte, Wedemark, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 3, 1981, Ser. No. 269,942

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3021012

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **4 Claims**



1. A method for effecting digital to analog conversion of PCM signals by a generalized interpolative procedure, comprising the steps of: sampling the PCM signals at a first sampling rate and effecting intermediate storage of each sampled PCM signal word in succession; supplying each stored word in succession to a first input of a first digital adder; dividing each word at the output of the adder into a first part representing the higher value portion of the adder output word and having a length shorter than that of the adder input word, and a second part representing the lower value part of the adder output word; conducting the second part of each adder output word through a digital, nonrecursive counter feedback filter having a degree greater than one at a clock pulse rate which is an integral multiple of the sampling rate, and supplying each resulting word at the filter output to a second input of the first digital adder where it is added to the stored word at the first adder input; transferring the first part of each adder output word at the clock pulse rate to a system output; setting the degree and pulse response of the filter to values minimizing the quantizing error, due to the difference in length and value between each adder output word first part and the corresponding sampled signal word, within the useful frequency band of the resulting signal in such a manner as to cause the power content of the quantizing error in that band to be negligible compared to the quantizing error power contained in the PCM signals; converting the successive adder output word first parts at the system output into an analog signal to a digital/analog converter having a small number of available output values; and passing the analog signal at the output of the converter through an analog lowpass filter for suppressing periodic continuations of the useful signal frequency band created by the sampling and for sufficiently attenuating the additional concentrated quantizing distortions due to the length of the adder output word first part being shorter than that of the word at the adder first input, wherein said step of conducting comprises: storing in respective locations of a fixed value memory representations of the filter coefficients; feeding the second part of each adder output word through a shift register chain having taps which are connected to the address input of the fixed value memory, the taps being so arranged that at each of them there appears one identical-value bit of the output word second parts; reading the representations out of one of the memory locations together with the bit pattern present at the shift register chain taps; summing the read out representations in an accumulative circuit connected between the output of the memory and the second digital adder input in such a manner that after a number of clock pulses corresponding to the length of each adder output word second part, a new word appears at the accumulator circuit output.

4,467,317

HIGH-SPEED ARITHMETIC COMPRESSION CODING USING CONCURRENT VALUE UPDATING

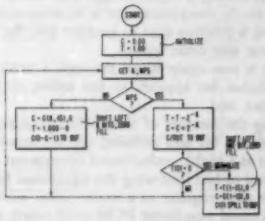
Glen G. Langdon, Jr., San Jose, and Jorma J. Rissanen, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US81/00400, § 371 Date Mar. 30, 1981, § 102(e) Date Mar. 30, 1981, PCT Pub. No. WO82/03514, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 30, 1981, Ser. No. 281,734

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 DD **4 Claims**



1. A machine-implementable method for recursively generating an arithmetically compressed binary number steam C(s.b) in high-to-low position magnitude order responsive to successive symbols b(i) from a binary symbol string s=b(1), b(2), . . . b(i), . . . , b(n), in a reduced number of operations per encoding cycle, comprising the steps of:

writing the q-least-significant bits of C(s) and an internal variable T(s) into respective first and second shift registers; and

ascertaining for each b(i) whether it constitutes a most-probable symbol (MPS); and

deriving an integer k as a coding parameter indicative of an expectation for the least-probable symbol (LPS); characterized in that

the method comprises the further steps of:

concurrently incrementing the first register contents and decrementing the second register contents by 2^{-k} and left-shift normalizing both register contents if the sec-

ond register contains a leading zero, if b(i) is an MPS; and

left-shifting the first register contents by k positions and setting the second register contents to unity, if b(i) is an LPS.

4,467,318

PROCESS FOR CONVERTING LINEAR CODED PCM WORDS INTO NON-LINEAR CODED PCM WORDS AND VICE VERSA

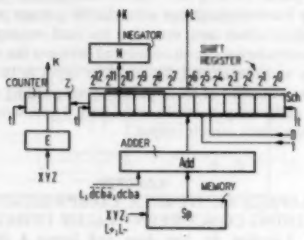
Rolf Zeitrueg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,294

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104528

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **2 Claims**



1. A process for converting linear coded PCM words into companded non-linear coded PCM words, and vice-versa linearizing non-linear PCM words, in accordance with a multiple segment curve and in accordance with a relationship governed by the μ-law, comprising the steps of: in the case of companding

adding linear coded PCM words having a positive sign to a specific bit combination and adding linear coded PCM words having a negative sign and which are represented as a two's complement of a corresponding PCM word having a positive sign to another specific bit combination to form sum code words,

shifting a sum code word through a shift register until a significant bit appears at the series output of the shift register, and

counting the number of shift pulses required to shift to the significant bit and defining the bit combination of such count as a higher-value word component and defining the number of bits following the significant bit and remaining in the shift register as a lower-value word component of the formed non-linear PCM code word; and

in the case of linearizing

for non-linear PCM words having a positive sign, adding a lower-value component corresponding to a grading within a segment in complementary form to a segment-individual bit combination to form a sum code word,

shifting the sum code word through the shift register a number of positions linked to the relevant segment number designated by that portion of the non-linear coded PCM word not taken into consideration and defining the same as a higher-value component of the linear coded PCM word, and setting those stages of the shift register which have been released and those stages which have not been reached during shifting to a binary 0 when they are assigned to the higher-value bit positions and to a binary 1 when they are assigned to low-value bit positions, and

for non-linear coded PCM words having a negative sign, adding a lower-value component corresponding to a grading within a segment to another segment-individual bit combination, shifting the sum code word through the shift register a number of positions linked to the relevant segment number designated by that portion of the non-linear coded PCM word not taken into consideration and defining the same as a higher-value component of the linear coded PCM word, and setting those stages of the shift register which have been released and those stages which have not been reached during shifting to a binary 1 when they are assigned to higher-value bit positions and to a binary 0 when they are assigned to lower-value bit positions, except the lowest value bit position stage is always set to a binary 0 when that corresponding segment is concerned and to a binary 1 when the other segments are concerned.

4,467,319

SIGNAL CONVERSION CIRCUIT

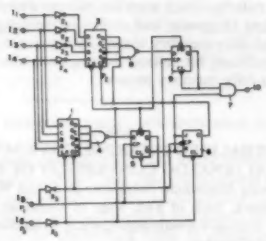
Gohji Uchikoshi, Higashimurayama, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,383

Claims priority, application Japan, Mar. 25, 1981, 56-43410

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **7 Claims**



1. A signal conversion circuit to convert a digital signal sampled in synchronism with a sampling pulse into a pulse width signal having a pulse width corresponding to the digital value of said digital signal and comprising;

a first counter to be preset to a first count value corresponding to a digital value of said digital signal and to begin to count a first clock signal having a predetermined pulse period from said first count value;

first detection means to detect a full count of said first counter;

a second counter to be preset to a second count value which is a complement of said first count value and to begin to count a second clock signal having a pulse period twice as many as that of said first clock signal from said second count value in response to the detection of said full count of said first counter by said first detection means;

second detection means to detect a full count of said second counter;

and a rising edge of said pulse width signal responding to the detection by said first detection means and a falling edge thereof responding to the detection by said second detection means whereby the center of a pulse width of said pulse width signal has a predetermined phase relation to said sampling pulse.

4,467,320

MEASUREMENT OF A LINEAR VARIABLE DIFFERENTIAL TRANSFORMER SIGNAL BY PHASE CONVERSION

Walter J. McPhee, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 6, 1982, Ser. No. 375,516

Int. Cl.³ H03K *13/00*

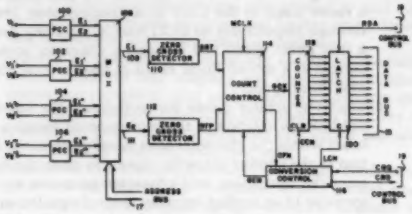
U.S. Cl. 340—347 SY **7 Claims**

1. A method for transforming a linear variable differential

transformer output into a digital number comprising the steps of:

generating an amplitude modulated signal K sin (wt) from one of the secondary output terminals of the LVDT, where w is the frequency of a carrier excitation and K is the position of the armature of the LVDT;

generating an amplitude modulated signal (1−K) sin (wt) from the other secondary output terminal of the LVDT;



converting said AM signals into phase modulated signals of the form sin (wt−θ+45°) and sin (wt+θ−45°) where cos θ is an approximation of K and sin θ is an approximation of 1−K as K varies from 0 to 1;

converting the phase difference between said PM signals into a digital number which is a linear function of θ;

calculating K from the values of θ and the equation:

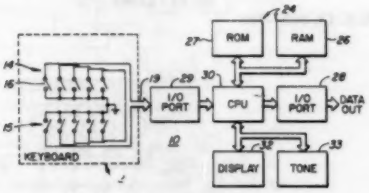
$$\theta = \text{arc tangent } \frac{1-K}{K}$$

4,467,321

CHORDING KEYBOARD FOR GENERATING BINARY DATA

William M. Volnak, 50 Birch St., Mill Valley, Calif. 94941

Filed Apr. 30, 1982, Ser. No. 373,569
Int. Cl.³ G06F 3/02
U.S. Cl. 340—365 VL **2 Claims**



1. A computer data entry keyboard comprising:

ten key-switches, each key-switch corresponding to, in continuous intimate contact with, and adapted to be selectably operated by a particular terminating member of a pair of operator's hands, said switches being selectably operable singly and in combination to generate a ten digit binary number, each digit of said binary number corresponding to a particular terminating member of said operator's hands;

user alterable memory means for storing character and character combinations in sequential memory addresses, including:

(a) read only memory means for storing and retrieving standard characters and character combinations, each corresponding to a particular one of said selective ten digit binary number; and

(b) a random access module for operation in an alter mode wherein operation of said key switches stores characters and character combinations each corresponding to a particular one of said selected ten digit binary numbers, at sequential memory addresses to labels key switches as desired, and for operation in an access mode wherein operation of said key switches retrieves characters and character combinations, each corresponding to said particular one of said ten digit binary numbers, from said sequential memory addresses; and

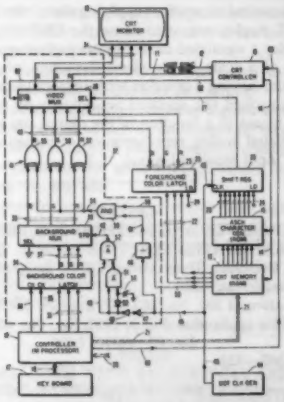
memory address table means for converting table locations each corresponding to a different ten digit binary number generated by selected operation of said key switches to memory addresses corresponding to starting memory addresses of characters and sequential character combinations.

4,467,322

DIGITAL SHADE CONTROL FOR COLOR CRT BACKGROUND AND CURSORS

Wayne D. Bell, Bountiful, and Thomas K. McFarland, Salt Lake City, both of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,688
Int. Cl.³ G09G 1/28
U.S. Cl. 340—701 **9 Claims**



1. Apparatus for changing the shade of the background color in a cathode ray tube of a video display, comprising:

means for selecting a predetermined background color and for generating background color selection signals,

means for storing said background color selection signals coupled to said means for selecting a predetermined background color,

pulse width modulation means coupled to said means for storing said background color selection signals and for gating said color selection signals,

timing means coupled to said pulse width modulation means for changing the duration of said background color selection signals,

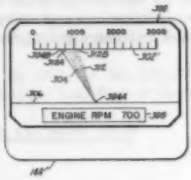
cathode ray tube display means, and

video signal selection means coupled to said pulse width modulation means and to said cathode ray tube for supplying attenuated background color selection signals to said cathode ray tube and for generating background color shades.

4,467,323
ENGINE ANALYZER WITH SIMULATED ANALOG METER DISPLAY

Michael J. Kling, Mequon, and Joseph A. Marino, Waukesha, both of Wis., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.

Filed Dec. 4, 1981, Ser. No. 327,732
Int. Cl.³ G09G 1/00
U.S. Cl. 340—721 **25 Claims**



1. An engine analyzer for testing systems and components of an internal combustion engine under test conditions, the engine analyzer comprising:

means for supplying a variable input electrical signal derived from the system of component of the internal combustion engine under a test condition;

means for periodically converting the input electrical signal to a digital signal;

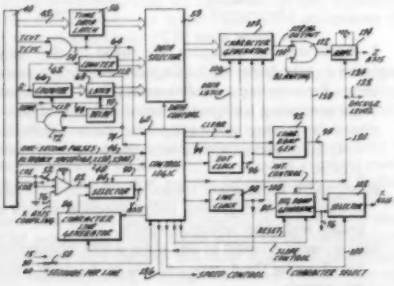
point addressable cathode ray tube (CRT) display means for displaying visual information based upon control signals; and

digital control means for supplying the control signals to the CRT display means to cause the CRT display means to display a simulated analog meter including a visual depiction of a scale and a visual depiction of a pointer, the pointer having a position with respect to the scale which is controlled and updated periodically by the digital control means as a function of the digital signal to provide a simulated analog representation of variation of the variable input electrical signal.

4,467,324
APPARATUS AND METHOD FOR PRINTING ANNOTATED ELECTROCARDIAL DATA

John A. Bachman, Dana Point, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Continuation of Ser. No. 163,777, Jun. 27, 1980, abandoned.
This application Jul. 3, 1982, Ser. No. 403,356
Int. Cl.³ G09G 1/00
U.S. Cl. 340—722 **6 Claims**



1. In a high speed data playback CRT printer having a single beam and an X and Y drive circuit of the type used to plot an applied, analog, ECG signal on a recording medium, and improvement for intermittently also printing on the recording medium, at times determined by an applied timing signal, characters represented by applied character signals and for printing the characters at such a high speed that only an insignificantly small part of the analog ECG plot is omitted while the characters are being printed, said improvement comprising:

scan circuit means for generating in response to an applied scan select signal an analog ECG scan signal and a raster character scan signal and for applying the analog ECG scan signal in an X-Y trace and the character scan signal in a raster trace to the CRT to alternately steer the beam through respectively an ECG scan X-Y tracing pattern at a first linear speed and through a character scan raster pattern at a second linear speed at least several times the first linear speed;

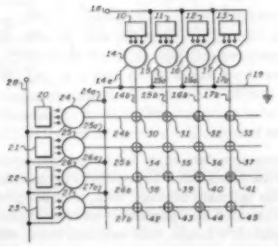
character generator means for modulating the intensity of the beam in relation to the instantaneous location of the beam within the character scan raster pattern and in relation to the applied character signals to cause the beam to print the characters, said character generator means responsive to an applied intensity control signal to maintain the intensity of the beam at a first level while the analog ECG signal is being traced to an X-Y plot and to increase the intensity of the beam when the characters are being traced in a raster scan to a second level at least several times greater than the first level to prevent diminution of intensity when it moves at the second linear speed; and,

control means connected to said scan circuit means and responsive to the applied timing signal for generating the scan select signal applied to said scan circuit means, and connected to the CRT for selectively passing the CRT the applied analog ECG signal when the beam is being steered through the ECG scan X-Y tracing pattern for generating the intensity control signal in relation to the applied timing signal, and further connected to said character generator means for applying thereto the intensity control signal.

4,467,325
ELECTRO-OPTICALLY ADDRESSED FLAT PANEL DISPLAY

Claude D. Lustig, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,688
Int. Cl.³ G09G 3/00
U.S. Cl. 340—794 **17 Claims**



1. A flat panel display comprising in combination:

a substrate;

an opaque insulating dielectric deposited on a portion of said substrate including:

a plurality of coupling window means for permitting the transmission of light therethrough; and

a plurality of decoupling window means for permitting the transmission of light therethrough, said coupling and decoupling windows being arranged in side-by-side columns and offset from one another;

ground conductor having a substantially rectangular area and a longitudinal axis parallel to said columns of coupling

and decoupling windows, and further having rectangular extensions therefrom having a longitudinal axis substantially perpendicular to the longitudinal axis of said first portion, said ground conductor being deposited upon said substrate and said extensions being deposited to intersect with said decoupling windows, insulating dielectric deposited over said rectangular area of said ground conductor;

first conductive means being substantially rectangular in form and having a longitudinal axis parallel to said columns of said coupling windows and further being deposited to intersect with said coupling windows;

a plurality of conductive grids having an axis substantially perpendicular to said coupling and decoupling window means and deposited over said insulating dielectric and said opaque insulating dielectric such that said plurality of conducting grids intersect with said decoupling and said corresponding coupling windows; and

photoconductive material deposited over said conductive grids and said rectangular extensions of said ground electrode in the area of said opaque dielectric insulator to form, in conjunction with said plurality of coupling window means and decoupling window means, a plurality of voltage dividers.

4,467,326

METHOD AND APPARATUS FOR PREVENTING THE RESPONSE OF A RADAR BEACON TO RECEIVE RADAR PULSES ORIGINATING FROM THE SIDE LOBES OF A TRANSMITTER AND AN ARRANGEMENT

Philip M. Charas, Mölndal; Per-Olof G. Gustavsson, Pixbo, and Bo A. Morwing, Åsa Station, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

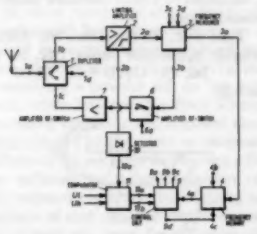
PCT No. PCT/SE80/00325, § 371 Date Jul. 17, 1981, § 102(e) Date Jul. 17, 1981, PCT Pub. No. WO81/01747, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 8, 1980, Ser. No. 284,184

Claims priority, application Sweden, Dec. 11, 1979, 7910168

Int. Cl.³ G01S *9/56*

U.S. Cl. 343—6.5 R **6 Claims**



1. A method of preventing the response of a radar beacon to radar pulses from one of a number of transmitters, each of said transmitters having an antenna which emits the radar pulses with a predetermined carrier frequency and a radiation pattern with a main lobe and several side lobes, said method comprising the steps of comparing the amptitude of a received radar pulse with upper and lower predetermined threshold values, the lower threshold value corresponding to the minimum peak value signal to which the radar beacon will respond, the upper value being chosen such that ratio between said upper and lower values is no greater than the ratio between the the peak values of the main lobe and the greatest side lobe of the antenna of a transmitter, measuring the carrier frequency of the received radar pulses and storing a representation of the carrier frequencies of those received radar pulses whose main lobes have a peak value greater than said uppper value, the storing being for a period of time at least equal to the time period between two successive radar pulses from the same transmitter, and controlling the radar beacon to respond to only those radar pulses whose lobe peak values either exceed said upper value or said lower value provided a representation of the associated carrier frequency has not been stored.

4,467,327

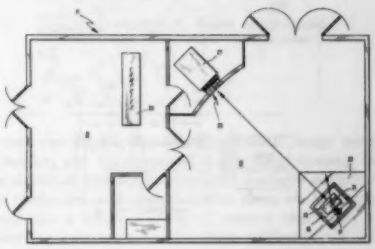
ACTIVE MILLIMETER WAVE SIMULATOR FOR MISSILE SEEKER EVALUATIONS

Douglas C. Drake, Kent; Kenneth L. Wismer, Renton, and Henry D. Ulrich, Sumner, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 22, 1981, Ser. No. 304,640

Int. Cl.³ G01S *7/40*

U.S. Cl. 343—17.7 **11 Claims**



1. In a passive simulator adapted for active mode missile seeker target tracking evaluations in real time wherein a missile seeker generates seeker signals having characteristic frequencies and a seeker timer signal associated with the seeker signals, an improvement comprising:

means for delaying said seeker timer signal to simulate a range between the missile and said target;

means for generating target response signals simulating the reflections of said seeker signals from said target;

means for determining the characteristic frequencies of said seeker signals and for generating an output signal corresponding thereto; and

means responsive to said delayed seeker timer signal and said output signal for controlling said generating means to generate said target response signals having frequencies corresponding to the frequencies of said seeker signals and amplitudes corresponding to said simulated range from said missile to said target.

4,467,328

RADAR JAMMER WITH AN ANTENNA ARRAY OF PSEUDO-RANDOMLY SPACED RADIATING ELEMENTS

Philip S. Hacker, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 26, 1981, Ser. No. 314,922

Int. Cl.³ G01S *7/36*

U.S. Cl. 343—18 E **5 Claims**

1. Radar jamming apparatus having a limited amount of available transmitting power for distribution over a predetermined coverage region for jamming radar threats residing therein, said apparatus comprising:

a radar jammer transmitting system for radiating said predetermined coverage region with said available transmitting power comprising:

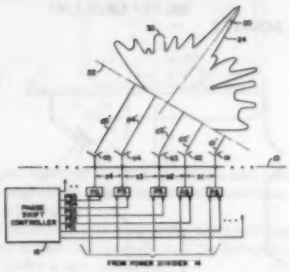
a plurality of radiating elements spaced apart pseudo-randomly to form a radiating antenna;

a jammer transmitter for developing a transmitting power signal at a desired carrier frequency from said limited amount of available transmitting power,

a power divider network for distributing said developed power signal to each of the elements of said radiating antenna, and

a plurality of phase shifters correspondingly coupled to said plurality of radiating elements, each phase shifter being operative to control the phase of the transmitting power signal distributed to the radiating element coupled thereto in accordance with a phase shift signal supplied thereto;

a directional finding system for detecting the presence of a threat in said coverage region based on radar signals received therefrom, and for determining the direction of said detected threat and generating a signal representative of said threat direction; and



means for generating said phase shift signals for governing correspondingly said plurality of phase shifters based on said threat directional signal and said pseudo-random spacings of said radiating elements to render:

a single narrow high power beam of jamming radiation from said radiating antenna directed at said detected threat in said coverage region, said high power beam containing only a small portion of said available transmitting power, and

simultaneously therewith, effective jamming radiation distributed substantially evenly over said coverage region against other threats which may reside therein.

4,467,329

LOADED WAVEGUIDE LENSES

Herbert L. Thal, Jr., Wayne, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed May 27, 1981, Ser. No. 267,436
Int. Cl.³ H01Q *15/06*
U.S. Cl. 343—753 **18 Claims**

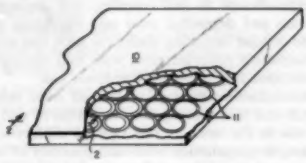
1. A waveguide lens comprising an array of individual waveguide elements arranged in proximate juxtaposition parallel to a central lens axis and extending between inner and outer lens surface contours, the outer boundary of said array defining a rim of said lens, an annular region of said array disposed between a predetermined lens radius and said lens rim having an outer surface contour which follows a constant group delay surface contour, selected ones of said individual waveguide elements in said annular region being modified to provide desired cut-off frequencies individually chosen so as to compensate the phase lengths of said selected waveguide elements, said modification of said waveguide elements providing substantially constant phase delay in said annular region, each of said waveguide elements having cross-sectional symmetry throughout its full length to provide polarization insensitivity.

4,467,330

DIELECTRIC STRUCTURES FOR RADOMES

Paul F. Vidal, Stow, Mass., and Fred N. S. Goodrich, Barnstead, N.H., assignors to Radant Systems, Inc., Stow, Mass.

Filed Dec. 28, 1981, Ser. No. 334,970
Int. Cl.³ H01Q *1/42*
U.S. Cl. 343—872 **15 Claims**



1. A structure for permitting transmission of electromagnetic energy therethrough comprising

a dielectric material capable of being formed into a structure having a selected configuration; and

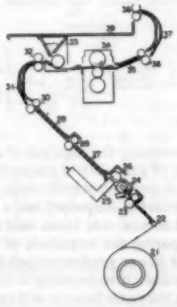
a plurality of metallic elements, each forming a completely closed loop configuration, placed within said dielectric material and arranged in a configuration such that a plurality of said elements are in contact with one or more elements adjacent thereto, said elements producing an inductive effect substantially equal to a capacitive effect produced by said dielectric material so as to match the electrical characteristics of said structure to a selected range of frequencies of said electromagnetic energy.

4,467,331

RECORDING APPARATUS

Teruo Tsutsumi, Tokyo, and Tetsuo Takahashi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 28, 1981, Ser. No. 335,287
Claims priority, application Japan, Dec. 26, 1980, 55-185924
Int. Cl.³ G01D *9/00, 15/06*
U.S. Cl. 346—22 **9 Claims**



1. A recording apparatus comprising:

a recording section for recording signals on a continuous, unused recording paper, starting with one end thereof;

cutting means for cutting the recording paper to a predetermined length after recording is completed;

a diagonally upward travelling path in which said cutting means and said recording section are arranged and along which the recording paper which is cut by said cutting

means travels, the diagonally upward travelling path having an exit side from which the recording paper is delivered;

a first curved travelling path located at the exit side of said diagonally upward travelling path and having an entrance side provided in the vicinity of the exit side of said diagonally upward travelling path and exit side, to permit the changing of a direction of the recording paper back on itself to be effected through a first curved guide member which is continuously provided from the entrance side to the exit side of said first curved travelling path;

a horizontal travelling path extending in the horizontal direction from the exit side of said first curved travelling path and having an exit side;

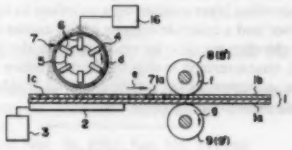
a developing device provided along said horizontal travelling path for causing a latent image on the recording paper, which is fed through said first curved travelling path to be developed into a visual image.

4,467,332

PROCESS FOR REGENERATING INK SHEET

Eiichi Akutsu, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,183
Claims priority, application Japan, Mar. 12, 1982, 57/39919
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—140 R **7 Claims**



1. A process for generating an ink sheet which comprises disposing an electrodepositing electrode in contact with a base layer of a used ink sheet comprised of an electrically conductive base layer and an ink layer superimposed on one side of said base layer, said ink layer having hollowed parts therein; disposing an opposed electrode at a fixed interval on the side of said ink layer; supplying a powder ink on the surface of the opposed electrode while impressing a fixed voltage between these electrodepositing electrode and opposed electrode, said powder ink being formed of the same or substantially same components as those of the ink layer and having a fixed voltage or conductivity sufficient to permit injection of inductive charge from the opposed electrode; transferring said powder ink from the surface of said opposed electrode mainly to the hollowed parts of said ink layer for adhering thereto; and thereafter fixing said adhered powder ink onto the base layer.

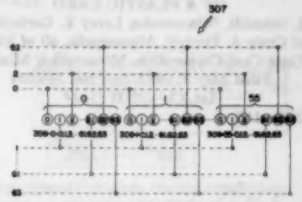
4,467,333

COPYING APPARATUS

Ryubun Seimiya; Shigeru Inowa, both of Hino; Noriyoshi Tarumi, Hachioji; Masahiko Matsunawa, Hachioji, and Hiroshi Tokunaga, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,020
Claims priority, application Japan, Mar. 29, 1980, 55-40996
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—154 **5 Claims**

1. In a copying machine comprising an image signal generating unit including an image pickup element for converting an optical image of an original into an electrical signal, an ion generating source, an electrostatic image forming unit including a charge flow control device which comprises control electrode means and common electrode means facing each other through a layer of electrically insulating material, said electrode control means comprising at least one row of mutually electrically insulated control electrodes, said charge flow control device having a plurality of fine openings therethrough with one opening extending through each of said control electrodes, and control means applying a first control voltage to said control electrode in accordance with the signal derived from said signal generating unit to control the charge flow



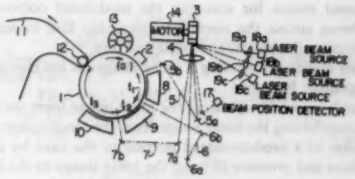
through said openings to form an electrostatic image upon a charge holder, the improvement comprising forming said common electrode means of at least two mutually electrically insulated electrodes with each common electrode being positioned opposite a different group of control electrodes, and means deriving a second control voltage applied to said common electrodes for controlling the flow of ions from the control electrodes in the group opposite that common electrode.

4,467,334

LASER BEAM PRINTER

Masayasu Anzai, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,306
Claims priority, application Japan, Oct. 9, 1980, 55-140429
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 **8 Claims**



1. A laser beam printer comprising a photosensitive medium in the form of a rotary drum, means for uniformly corona-charging the surface of said photosensitive medium, laser beam sources generating a plurality of laser beams, respectively, a mirror scanner deflecting said plural laser beams for the purpose of scanning, a laser beam position detector generating its output signal by receiving at least one of said plural laser beams, and circuit means for determining the timing of starting modulation of each of said plural laser beams by data information applied from a data information source means when it detects that a printing command signal is applied in the presence of the output signal from said laser beam position detector, said laser beam printer further comprising a plurality of exposure means for exposing a plurality of different portions of the uniformly charged surface of said photosensitive medium to said plural laser beams thereby forming electrostatic latent images on said plural different portions of the surface of said photosensitive medium, developing means for enabling development of said plural latent images with toners of a plurality of predetermined colors thereby forming a plurality of color toner images, and transfer means for simultaneously transfer-

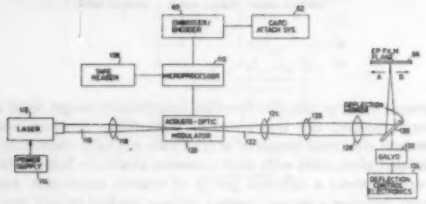
ring said plural color toner images formed on the surface of said photosensitive medium onto a recording medium.

4,467,335

SYSTEM FOR FORMING AN IMAGE ON THE SURFACE OF A PLASTIC CARD

Robert H. Schmidt, Minnetonka; Leroy E. Gerlach, Bloomington, and Craig A. Fordahl, Minneapolis, all of Minn., assignors to Data Card Corporation, Minnetonka, Minn.

Filed May 7, 1982, Ser. No. 376,031
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 11 Claims



4. A system for forming an image on a card, comprising:

a roll of electrophotographic film;

corona means for applying an electrostatic charge to the surface of the electrophotographic film to sensitize the film to receive an image;

a laser light source for generating a coherent light beam;

first means for receiving a digital image signal;

an acousto-optic modulator, operatively connected to said first means and positioned in the path of the coherent light beam, for modulating the coherent light beam in accordance with the digital image signal;

second means for scanning the modulated coherent light beam across the electrophotographic film to selectively expose the electrophotographic film;

third means for forming a toner image on the electrophotographic film; and

fourth means for releasing the toner image from the film and transferring the toner image from the electrophotographic film to a predetermined portion of the card by applying heat and pressure to bond the toner image to the card and release it from the electrophotographic film.

4,467,336

HEAT-SENSITIVE RECORDING SHEET WITH IMPROVED PRINTABILITY AND PROCESS FOR PRODUCING THE SAME

Naomasa Koike, Tokyo, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,655
Claims priority, application Japan, Jul. 9, 1982, 57-120332; Sep. 2, 1982, 57-153071
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—200 6 Claims

1. A heat-sensitive recording sheet containing a colorless to light-colored dye precursor and a color developer which causes said dye precursor to develop a color by reacting with the dye precursor when heated, characterized by having the maximum peak of the void distribution curve at a void diameter of 1.0 μm or less.

4,467,337

CHEMICAL CARBONLESS COPY PAPER

Gene D. Carlson, Ankeny, and Walter S. Trahanovsky, Ames, both of Iowa, assignors to Frye Copysystems, Inc., Des Moines, Iowa

Filed May 4, 1982, Ser. No. 374,703
Int. Cl.³ B41M *5/22*
U.S. Cl. 346—209 2 Claims

1. In a pressure sensitive chemical type transfer medium formed of planar sheet material having an at least partially transferable coating layer disposed on one surface thereof constituted by the solidified residue of an applied hot melt low oil content wax base emulsified liquid film having discrete liquid droplets of a concentrated water base solution of ionized zinc chloride distributed therein, the improvement comprising about 1–10% by weight of lithium chloride incorporated in the water phase thereof to enhance water retention and formed image intensity under ambient low humidity conditions.

4,467,338

HEAT-SENSITIVE RECORDING SHEET

Shigetoshi Hiraishi, Tokyo, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,456
Claims priority, application Japan, Jun. 29, 1982, 57-112106
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—209 6 Claims

1. A heat-sensitive recording sheet comprising a heat-sensitive recording layer containing a colorless to light-colored dye precursor and a color developer which causes said dye precursor to develop a color by reacting with the precursor when heated, characterized in that the heat-sensitive recording layer further contains as a stabilizer, 1,1,3-tris(3-tertiarybutyl-4-hydroxy-6-methylphenyl)butane.

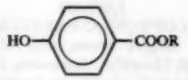
4,467,339

THERMOSENSITIVE RECORDING MATERIAL

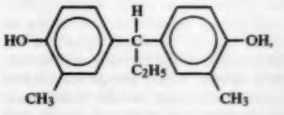
Shinichi Asami; Hiroshi Sakamoto, and Norihiko Inaba, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,210
Claims priority, application Japan, Jun. 11, 1981, 56-90046
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—214 11 Claims

1. A thermosensitive recording material comprising a support and a thermosensitive coloring layer formed on said support, said thermosensitive coloring layer comprising a colorless or light-colored coloring material and a developing material capable of developing the color of said coloring material upon application of heat to said thermosensitive coloring layer, wherein the improvement comprises: said developing material consists essentially of (i) at least one p-hydroxybenzoic acid ester of the formula:



wherein R represents alkyl having 1 to 4 carbon atoms or benzyl, and (ii) at least one bisphenol derivative selected from the group consisting of:



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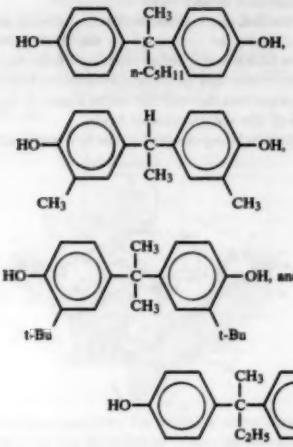
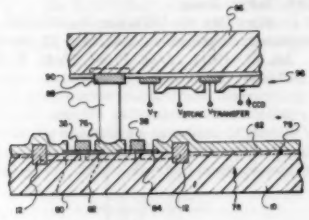


4,467,340

PRE-MULTIPLEXED SCHOTTKY BARRIER FOCAL PLANE

Jonathan P. Rode, and Kuen Chow, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 16, 1981, Ser. No. 321,360
Int. Cl.³ H01L *29/78, 27/14, 31/00, 29/56*
U.S. Cl. 357—24 13 Claims



9. A hybrid Schottky barrier focal plane, comprising:

a transparent semiconducting detector substrate;

an array of detector groups disposed on said detector substrate, each group comprising a plurality of Schottky barrier detectors;

an output contact on said detector substrate for each of said detector groups;

a switching device associated with each detector on said detector substrate for selectively connecting said detector to one of said output contacts;

a semiconducting multiplexer substrate;

an array of input contacts disposed on said multiplexer substrate;

a multiplexing circuit on said multiplexer substrate for connecting parallel signals from said input contacts to a serial output signal; and

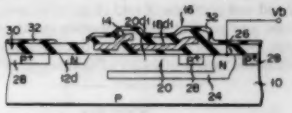
an array of coupling elements, each said element electrically connecting one of said output contacts to one of said input contacts.

4,467,341

CHARGE TRANSFER IMAGING DEVICE WITH BLOOMING OVERFLOW DRAIN BENEATH TRANSFER CHANNEL

Nobuo Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 27, 1983, Ser. No. 461,516
Claims priority, application Japan, Feb. 12, 1982, 57-20804
Int. Cl.³ H01L *29/78, 27/14, 31/00*
U.S. Cl. 357—24 3 Claims



1. A charge transfer imaging device comprising:

a semiconductor substrate of a first conductivity type;

photosensitive sites formed in superficial portions of said semiconductor substrate for generating and storing signal charge in response to an incident light signal, said photosensitive sites being first semiconductor regions of a second conductivity type;

a shift electrode for controlling the transfer of said signal charge through said semiconductor substrate;

a charge transfer shift register for reading out said signal charge by transferring the same from said shift electrode through transfer channels formed in and continuous to the surface of said semiconductor substrate;

a second semiconductor region formed in said semiconductor substrate other than a portion of the substrate below said photosensitive sites and at least under said transfer channels of said shift register; and

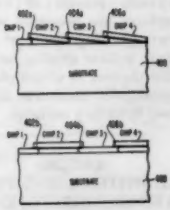
means for applying a reverse bias voltage between said second semiconductor region and said semiconductor substrate.

4,467,342

MULTI-CHIP IMAGER

John R. Tower, West Deptford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,601
Int. Cl.³ H01L *27/14, 31/00, 29/78, 27/10*
U.S. Cl. 357—30 8 Claims



1. In a solid-state radiant energy imager adapted to be illuminated by means of imaging optics with an image, said imager being comprised of at least two contiguous juxtaposed solid-state imager chips in which each of said two chips includes at least one corresponding line of periodically spaced pixel detectors, the respective spacing periods of said pixel detectors of said corresponding lines of said two chips being substantially the same as one another; the improvement:

wherein an end portion of one of said two chips overlaps an end portion of the other of said two chips and said two chips are joined together by a lap joint in which the extent

of overlap of said two chips is arranged such that the spacing distance, between a pixel detector situated within said end portion of said one of said two chips and a pixel detector situated within said end portion of said other of said two chips, is substantially equal to that of said respective spacing periods of said corresponding lines of said two chips, so that no pixel detector gap occurs at lap joint seam, and

wherein each of said two chips is sufficiently thinned so that radiant energy illuminating said lap joint can pass through said chips and reach all pixel detectors within said overlapped end portions of said chips with insignificant attenuation, and so that the respective depth positions of the pixel detectors of said two overlapped chips are both within the depth of focus of said imaging optics.

4,467,343

THYRISTOR WITH A MULTI-LAYER SEMICONDUCTOR BODY WITH A PNPN LAYER SEQUENCE AND A METHOD FOR ITS MANUFACTURE WITH A {111} LATERAL EDGE BEVELLING

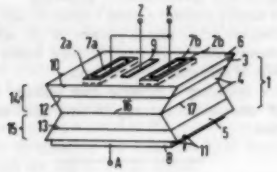
Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,561

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137695

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **8 Claims**



1. A thyristor having a multi-layer semiconductor body with pnpn layer sequence which exhibits two boundary surfaces that lie essentially parallel to the pn-junctions between the individual layers, wherein said boundary surfaces exhibit a {100} direction orientation, are rectangularly configured, and have lateral limits which extend parallel to a {110} direction orientation; and wherein a plurality of {111} direction oriented pairs of lateral surfaces are provided which each proceeds from mutually corresponding limits of both said boundary surfaces and meets in a plane situated between said boundary surfaces and parallel thereto, in which plane said semiconductor body has a rectangular, minimum cross-sectional surface lying parallel to said boundary surfaces.

4,467,344

BIDIRECTIONAL SWITCH USING TWO GATED DIODE SWITCHES IN A SINGLE DIELECTRICALLY ISOLATED TUB

Gee-Kung Chang; Adrian R. Hartman, both of New Providence, and Harry T. Weston, Berkeley Heights, all of N.J., assignors to AT&T Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1981, Ser. No. 333,700

Int. Cl.³ H01L *29/747, 29/74, 29/06*

U.S. Cl. 357—39 **18 Claims**

1. A semiconductor structure comprising:

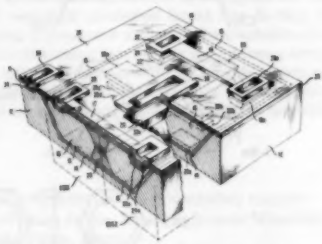
a semiconductor body whose bulk is of one conductivity type and which has a major top surface;

first and second separate localized regions of the one conductivity type;

third and fourth separate localized regions which are of the opposite conductivity type of the bulk portion of the semiconductor body;

the first, second, third, and fourth regions being of relatively low resistivity as compared to the bulk portion of the semiconductor body, being separated from each other by portions of the bulk of the semiconductor body, and each having a portion thereof that forms a part of the major top surface of the semiconductor body;

a first electrode being coupled to the first and fourth regions;



a second electrode being coupled to the second and third regions;

a localized fifth region of the opposite conductivity type of the bulk of the semiconductor body and located with the first and third regions on one side thereof and with the second and fourth regions on the other side thereof such that the first and third regions are essentially electrically isolated from the second and fourth regions; and

a third electrode being coupled to the fifth region.

4,467,345

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

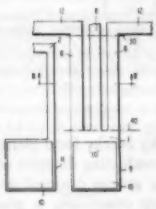
Masahide Ozawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,805

Claims priority, application Japan, Oct. 23, 1980, 55-148770

Int. Cl.³ H01L *23/48, 29/44, 29/34, 29/52*

U.S. Cl. 357—68 **8 Claims**

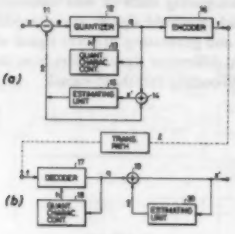


1. A semiconductor integrated circuit device comprising a semiconductor substrate; an insulation layer, formed onto said semiconductor substrate; a bonding pad, formed onto said insulation layer; a metallic electrode wiring layer providing a power supply line or ground potential line formed onto said insulation layer and extending from said bonding pad; and a protecting insulation film covering said wiring layer, disposed such that an area of said bonding pad is exposed, said wiring layer being divided at a position less than 50 μm from said exposed area of said bonding pad into at least two wiring layer sections, said wiring layer sections being extended in the same direction substantially in parallel to each other and bent by different angles at a predetermined distance from the divided position to further extend in different directions.

4,467,346
ADAPTIVE QUANTIZER

Sumio Mori, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 9, 1982, Ser. No. 356,545
Claims priority, application Japan, Mar. 11, 1981, 56-34909
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—12 **7 Claims**



1. An adaptive quantizer, for which a color image signal is color-separated into a plurality of color components to obtain an input picture element value for each color component of each picture element, and said input picture element values are divided into blocks consisting of a plurality of adjacent picture element values for each color component, comprising:

means (11) for obtaining estimation error between said input picture element value and a quantized estimation value of said input picture element value;

a quantizer (31) for quantizing said estimation error by using a selected quantization characteristic from one of a plurality of quantization characteristics provided for each color component and having quantization steps suitably determined for a respective color component;

a quantization characteristic determining unit (32, 33) receiving the output of said quantizer for determining a quantization characteristic to be used for the next block according to the distribution of quantization level values provided when said estimation error in one block is quantized according to said selected quantization characteristic;

a quantization characteristic selector (35) receiving an output of said quantization characteristic determining unit for selecting said selected quantization characteristic; and

means (14, 15) for estimating a quantized estimation value of said input picture element value from a plurality of quantized estimation errors of other input picture element values.

4,467,347
COLOR IMAGING DEVICE

Naoki Ozawa, Kokubunji; Shusaku Nagahara, Hachioji; Kenji Takahashi, Kodaira; Masuo Umemoto; Kazuhiro Sato, both of Tokyo; Morishi Izumita, Inagi; Toshiyuki Akiyama, Kodaira; Masanori Sato, Kokubunji, and Koji Kudo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 5, 1982, Ser. No. 346,195
Claims priority, application Japan, Feb. 6, 1981, 56-15745
Int. Cl.³ H04N *9/07*
U.S. Cl. 358—44 **17 Claims**

1. In a color imaging device having a filter assembly comprising a plurality of filter members arrayed two dimensionally in rows and columns extending, respectively, in horizontal and vertical directions, the plurality of filter members including a first filter adapted to transmit a specified color light or all colors of light and a second filter formed of a plurality of filter elements adjacent to the first filter in horizontal and vertical directions, at least one of the filter elements being adapted to transmit a color light different from that of the first filter, photoelectric conversion means to recieve an object image through the filter assembly and to convert it into image signals, signal readout means to sequentially read out the image signals from the photoelectric conversion means, a signal processing circuit including color signal demodulation means to form at least one color signal by combining, among the signals from the readout means, an image signal concerning the color light transmitted through the first filter and an image signal concerning the color light transmitted through the second filter, and a circuit which synthesizes a luminance signal out of the

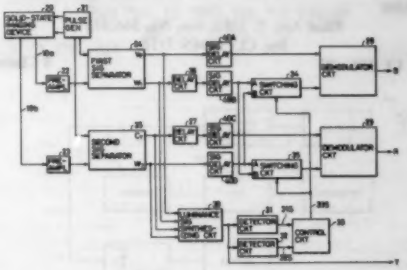
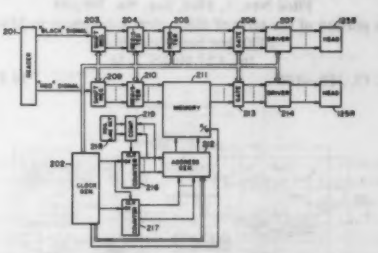


image signals from the signal readout means, the improvement comprising sensing means to sense a change in the luminance signal provided from the luminance signal synthesizing circuit in the horizontal or vertical direction, and control circuit means for providing a control signal for controlling said color signal demodulation means so as to select the combination of the image signals transmitted through the vertical or horizontal arranged filter members, respectively, in accordance with an output of said sensing means.

4,467,348
IMAGE RECORDING DEVICE

Motoharu Fujii, Tokyo; Noboru Koumura, Narashino; Yasushi Sato, Kawasaki; Naoki Ayuta, Yokohama, and Seiji Saito, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1981, Ser. No. 228,732
Claims priority, application Japan, Feb. 1, 1980, 55-11335; Feb. 4, 1980, 55-12252; Feb. 4, 1980, 55-12251; Mar. 10, 1980, 55-30083
Int. Cl.³ H04N *1/26*
U.S. Cl. 358—78 **9 Claims**



1. An image recording device, comprising:

color signal forming means for forming, by scanning an original image, a plurality of electrical color signals corresponding to a plurality of mutually different colors;

a plurality of recording members for performing recording on a recording medium with colors corresponding to said plurality of different colors; and

selection means to select whether said color signals are to be applied to one of said recording members in said colors

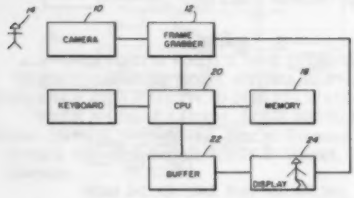
corresponding to the different colors of said color signals, or whether they are to be applied in colors not corresponding to the different colors of said color signals, or whether one of said color signals is not to be applied to one of said recording members.

4,467,349

SYSTEM AND METHOD FOR COMPOSITE DISPLAY

Laurence G. Maloomian, 28 Crystal Hill Ter., Westwood, Mass. 02090

Filed Apr. 7, 1982, Ser. No. 366,372
Int. Cl.³ H04N 7/18
U.S. Cl. 358—93 **8 Claims**



1. A system for displaying a full figure composite display of two separate images which comrises:

means to record as a first image at least a portion of a customer's body;

means to record as a second image at least a portion of clothing;

means to store the second image;

means to display at least a portion of the first image;

means to determine if the stored image is proportional to the displayed portion of the first image;

means to vary the dimensions of the stored image and output the same, the dimensions varied based on the first image; and,

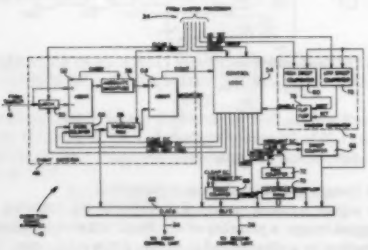
means to display the stored image in combination with and contiguous to the displayed first image whereby a fully proportioned full figure composite is displayed.

4,467,350

METHOD AND APPARATUS FOR RAPIDLY EXTRACTING SIGNIFICANT DATA FROM A SPARSE OBJECT

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 7, 1980, Ser. No. 205,054
The portion of the term of this patent subsequent to Mar. 29, 2000, has been disclaimed.
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **14 Claims**



1. In an apparatus for detecting defects in successive objects and for providing a plurality of digital signals each representing the magnitude of light received from a corresponding point on an object, an interface circuit comprising:

means for storing the digital signals;

means for generating for each one of the digital signals a difference signal representing the difference in magnitudes between said one digital signal and a preceding one of the digital signals;

means for storing a plurality of different threshold signals, each associated with the location of a different corresponding point on the object; and

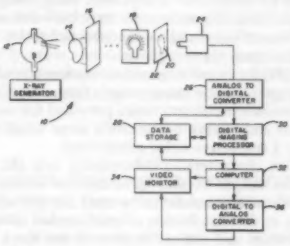
means for comparing each of said difference signals with each of said threshold signals at corresponding points on the object and generating an event signal when the magnitude of said difference signal differs from the magnitude of said corresponding threshold signal.

4,467,351

MINIMAL RADIOLOGIC IMAGING METHOD AND APPARATUS

Yen Wang, 6883 Reynolds St., Pittsburgh, Pa. 15208

Filed Nov. 30, 1981, Ser. No. 325,656
Int. Cl.³ H04N 5/14
U.S. Cl. 358—111 **8 Claims**



1. Apparatus for radiologic diagnosis of an object by projecting penetrating radiation through the subject comprising,

a source of radiation for emitting X-rays or Gamma rays at a preselected intensity,

said radiation source being controlled to emit X-rays or Gamma rays at a preselected magnitude less than 100% of the radiation intensity of said source upon said subject,

conversion means for converting the radiation emerging from the subject to an output signal corresponding to the intensity of the emerging radiation,

means for digitalizing said output signal to a digital signal,

enhancement means for receiving said digital signal and enhancing said digital signal to a corresponding digital signal representing 100% of the radiation intensity by comparing the optical density at a pixel of a radiologic image obtained at a minimal level of radiation intensity less than 100% intensity of the radiation source with the optical density at a pixel of a radiologic image obtained at 100% intensity of the radiation source to obtain a numerical relation between said optical densities,

means for mapping the optical density values over a preselected area of the radiologic image obtained at the minimal level of radiation intensity,

means for converting said optical density values at the minimal level of radiation by a preselected factor obtained from said numerical relation to optical density values representative of the 100% level of radiation, and

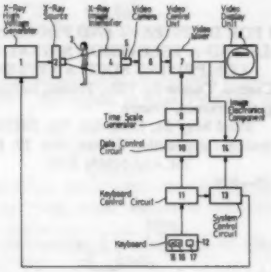
image generating means for receiving said enhanced digital signal and producing a radiologic image of the subject.

4,467,352

X-RAY DIAGNOSTIC SYSTEM COMPRISING AN IMAGE INTENSIFIER TELEVISION CHAIN

Werner Saalfrank, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,312
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 32019882
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 1 Claim



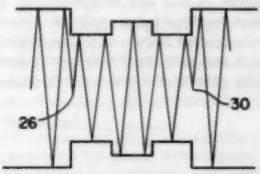
1. An X-ray diagnostic system, comprising an image intensifier television chain (4, 5, 6, 7, 8), and control means (9, 10, 11, 12) for the fading-in of data into the television image, characterized in that said control means comprises a time scale generator (9) for the purpose of fading in a time scale (FIG. 2) and a mark movable over the time scale, and selector means (12) for the programming of predetermined times when image formation is to take place given corresponding positions of the mark with respect to the time scale.

4,467,353

TELEVISION SIGNAL SCRAMBLING SYSTEM AND METHOD

Richard W. Citta, Oak Park, and Ronald B. Lee, Skokie, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 25, 1982, Ser. No. 361,329
Int. Cl.³ H04N 7/16; H04K 1/00
U.S. Cl. 358—120 21 Claims



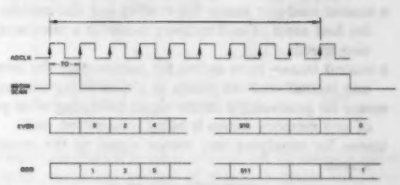
1. A television signal transmission system comprising:
means for developing and transmitting an encoded television signal having a suppressed amplitude and a first carrier signal phase characteristic during selected horizontal blanking intervals and having an unsuppressed amplitude and a second carrier signal phase characteristic different from said first phase characteristic during all video scan lines and other horizontal blanking intervals;
means for receiving said encoded television signal;
phase modulation detection means responsive to said received television signal for detecting said selected horizontal blanking intervals; and
means responsive to said detection means and to said received television signal for developing a decoded television signal having an unsuppressed amplitude and a constant carrier signal phase characteristic.

4,467,354

VIDEO FORMAT UNIT

John C. Eby, Jr., Monroe, La.; David L. Cauthron, Hurst, Tex.; Michael M. Ludeman, Irving, Tex., and James R. Hicks, Austin, Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Nov. 12, 1981, Ser. No. 320,406
Int. Cl.³ H04N 1/40
U.S. Cl. 358—133 17 Claims



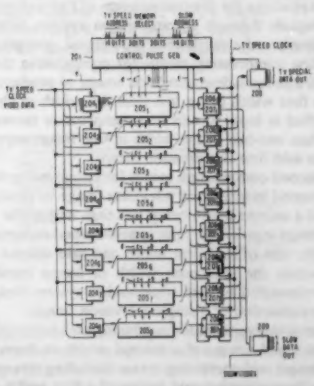
1. An image system video format unit wherein video data representative of a document image or portions thereof is received in a gray data format, enhanced and compressed prior to storage, comprising: means for receiving the video data and enhancing the black/white characterization thereof including a plurality of overlapping image enhancers which independently process overlapped areas of the document video to produce a single continuous video image, means for storing a complete image, means for scanning the image and coding the scans thereof to compress the amount of data representative of the image, means for storing portions of the compressed video data as it is generated, and means for tracking the video data through the above means to monitor it for errors.

4,467,355

FREEZE-PICTURE TRANSMISSION APPARATUS

Akio Matsuda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1982, Ser. No. 342,685
Claims priority, application Japan, Jan. 28, 1981, 56-11212
Int. Cl.³ H04N 7/12
U.S. Cl. 358—134 10 Claims



1. A freeze-picture transmission apparatus comprising:
an input means receiving four video signals representing four pictures for selecting a first of said four video signals;

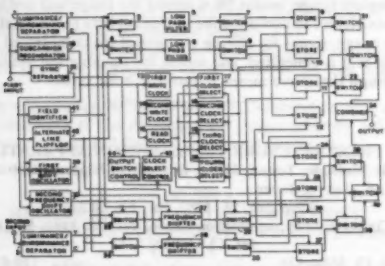
a memory means having four areas collectively corresponding to one full TV screen;
a write-in means coupled to said input means and said memory means for compressing the selected video signal delivered from said input means and writing the compressed, selected video signal into one of said four areas of said memory means;
a first read out means for reading out the selected video signal from one of said four areas of said memory means at a speed corresponding to a frequency equal to or lower than an upper limit of a transmittable frequency of a transmission line;
a first transmission means for transmitting the selected video signal read out by said first read-out means to the transmission line;
a second read-out means for reading out the content of all the four areas of said memory means at a television scanning speed;
a second transmission means for transmitting the output of said second read-out means to a monitoring screen;
means for producing a cursor signal indicating what portion of said memory means is being transmitted; and
means for supplying said cursor signal to the monitoring screen.

4,467,356

TRANSMITTING TWO TELEVISION SIGNALS THROUGH ONE CHANNEL

Reginald F. H. McCoy, 1354 NE. 31st Pl., Gainesville, Fla. 32601

Filed Sep. 24, 1981, Ser. No. 305,049
Int. Cl.³ H04N 7/08
U.S. Cl. 358—146 **4 Claims**



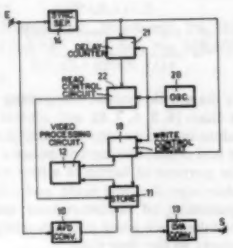
1. Apparatus for the transmission of two independent television signals through a transmission system designed for the transmission of a single television signal, comprising:
a. first compression means for compressing the width of a first independent television image to produce an image of a first width being less than the width of the image supplied as input to said first compression means and greater than one-half of the width of said image supplied as input to said first compression means,
b. second compression means for compressing the width of a second independent television image to produce an image of a second width being less than half of the width of the image supplied as input to said second compression means, the sum of said first width and said second width being within the maximum width of image capable of being transmitted by said transmission system designed for the transmission of a single television image,
c. combining means for combining said image of a first width and said image of a second width to form a combined image, said combining means including means for horizontally positioning said image of a first width and separate means for horizontally positioning said image of a second width to be separated from, and horizontally adjacent to, said image of a first width,
d. means for separating said image of a first width and said image of a second width from said combined image,
e. first expansion means for expanding the width of said image of a first width to produce a first expanded image of normal width, and
f. second expansion means for expanding the width of said image of a second width to produce a second expanded image of normal width.

4,467,357

SYSTEM FOR DIGITIZING AND PROCESSING VIDEO SIGNALS AND A TELEVISION SIGNAL RECEIVER COMPRISING SUCH A SYSTEM

Christian Cantou, Combs-La-Ville, France, assignor to La Radiotechnique, Suresnes, France

Filed May 24, 1982, Ser. No. 381,087
Claims priority, application France, Jun. 19, 1981, 81 12122
Int. Cl.³ H04N 5/04
U.S. Cl. 358—148 **2 Claims**



1. A system for digitizing and processing video signals, having a circuit for separating the line synchronizing signals from an input video signal, a digital store for storing a digital version of said input video signal, a write control circuit for controlling the writing into said store, a circuit for processing the signals in the store, and a read control circuit for controlling the reading from the store and for regaining an output video signal; characterized in that said system comprises a delay counter, having a delay equal to an integral number of times a television line period, coupled to an input of said read control circuit, and a clock circuit having an oscillator which is independent of said line synchronizing signals, an output signal of said oscillator being applied to respective clock inputs of said write control circuit, said read control circuit and said delay circuit, and said line synchronizing signals being applied to said delay counter and said write control circuit.

4,467,358

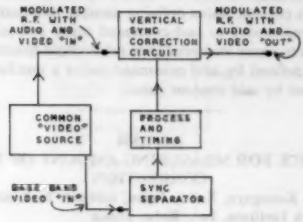
VIDEO TAPE RECORDER SIGNAL PROCESSOR

Henry N. Switsen, 17236 Bircher St., Granada Hills, Calif. 91344

Filed Feb. 9, 1982, Ser. No. 347,339
Int. Cl.³ H04N 5/76
U.S. Cl. 358—153 **18 Claims**

1. A vertical sync signal strengthening circuit for strengthening the vertical sync signal in a base band composite video signal containing a weak vertical sync signal comprising:
extracting means connected to the conductor carrying said video signal from its source to its destination, for extracting vertical sync signal information from said video signal;
means to process said vertical sync signal information to

provide a correcting signal to strengthen said weak vertical sync signal; and


MODULATED R.F. WITH AUDIO AND VIDEO "IN"
VERTICAL SYNC CORRECTION CIRCUIT
MODULATED R.F. WITH AUDIO AND VIDEO "OUT"
COMMON "VIDEO" SOURCE
PROCESS AND TIMING
BASE BAND VIDEO "IN"
SYNC SEPARATOR

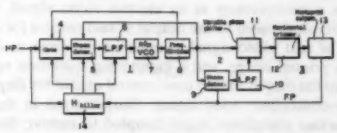
means to couple said correcting signal back to the conductor carrying said video signal, to strengthen said weak vertical sync signal.

4,467,359

HORIZONTAL SYNCHRONIZING CIRCUIT

Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00231, § 371 Date Apr. 15, 1982, § 102(e) Date Apr. 15, 1982
PCT Filed Sep. 11, 1981, Ser. No. 373,496
Int. Cl.³ H04N *5/04*
U.S. Cl. 358—159 **8 Claims**



1. A horizontal synchronizing circuit for synchronizing the timing of horizontal deflection operation with a horizontal synchronizing signal, which circuit comprises a horizontal AFC circuit including a variable frequency oscillator for generating a series of pulses having a frequency substantially higher than the horizontal frequency and equal to n times the horizontal frequency, wherein n is a natural number, a frequency dividing circuit for generating a series of pulses obtained by dividing the frequency of said first series of pulses by a plurality of different rates, and a first phase detecting circuit for comparing the phase of said series of pulses from the frequency dividing circuit, having a frequency equal to said horizontal frequency, with the phase of the horizontal synchronizing signal and generating a first phase difference signal corresponding to the phase difference, the oscillating frequency of said variable frequency oscillator being controlled by said first phase difference signal, and

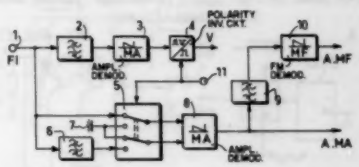
a horizontal APC circuit including a horizontal deflecting circuit for generating a horizontal flyback pulse, a second phase detecting circuit for comparing the phase of the series of pulses from said frequency dividing circuit, having a frequency equal to said horizontal frequency, with the phase of the horizontal flyback pulse and generating a second phase difference signal corresponding to the phase difference therebetween, a logic circuit for forming a pulse occurring at the middle of a pulse interval of said horizontal synchronizing pulse by the combination of a number of series of pulses produced from said frequency dividing circuit, a variable phase shifting circuit for shifting the phase of said pulse from said logic circuit by an amount corresponding to said second phase difference signal, and a control means for synchronizing the operation of said horizontal deflection circuit in accordance with the pulse produced from said phase shifting circuit.

4,467,360

MULTI-STANDARD TELEVISION RECEIVER FOR RECEIVING A TELEVISION SIGNAL WHOSE SOUND CARRIER IS FREQUENCY-MODULATED (FM) OR AMPLITUDE-MODULATED (AM)

Robert Fosse, Rueil-Malmaison, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,192
Claims priority, application France, Jul. 1, 1981, 81 12938
Int. Cl.³ H04N *5/62*; H04B *1/16*
U.S. Cl. 358—197 **6 Claims**



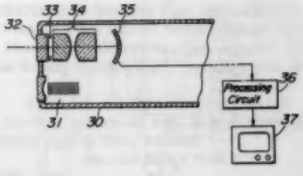
1. A multi-standard television receiver for receiving a television signal the sound carrier of which is either frequency modulated (FM) or amplitude-modulated (AM), having means for providing an intermediate frequency-signal including a picture and a sound carrier intermediate frequency, a video-frequency demodulation circuit, and a sound-frequency demodulation circuit, characterized in that said sound-frequency demodulation circuit comprises a filter circuit for receiving said intermediate frequency signal, a sound-amplitude demodulation circuit having input means and an output, switching means for selectively applying said intermediate frequency signal and an output of said filter to said sound-amplitude demodulation circuit input means, a further filter coupled to the output of said sound-amplitude demodulation circuit, and an FM demodulation circuit coupled to an output of said further filter, whereby on receipt of an AM sound carrier, said AM demodulation circuit provides a respective sound signal, while on receipt of an FM sound carrier, said FM demodulation circuit provides the sound signal.

4,467,361

IMAGE PICK-UP APPARATUS

Kunio Ohno, Tokyo; Kimihiko Nishioka, Hachioji; Nobuo Yamashita, Hachioji; Susumu Takahashi, Hachioji; Akihiro Namba, Hachioji; Takashi Mizusaki, Sendai; Toshimasa Akagi, and Masaru Iino, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,486
Claims priority, application Japan, Aug. 14, 1981, 56/126562
Int. Cl.³ H04N *1/12*
U.S. Cl. 358—213 **15 Claims**



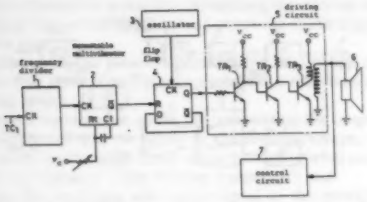
1. In an apparatus for picking-up an image of an object comprising a solid state image sensor having a number of image sensing elements, and an optical system for forming an image of an object to be picked-up on the image sensor, the improvement in that said image sensor is so curved that respective image sensing elements are situated on a curved surface on which the image of the object is formed.

4,467,362

APPARATUS AND METHOD FOR TRANSMITTING ULTRASONIC WAVE

Wataru Hasegawa, Sakai, and Katsuji Ishikawa, Higashiosaka, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Apr. 2, 1982, Ser. No. 364,634
Claims priority, application Japan, Apr. 10, 1981, 56-54912
Int. Cl.³ H04N 9/28
U.S. Cl. 358—227 3 Claims



1. An ultrasonic transmission apparatus for use in image producing apparatus for auto-focusing comprising:

counter circuit means for counting blanking pulses of a vertical synchronization signal, of said image producing apparatus,

a pulse generator for generating a pulse signal of a predetermined time width in response to an output signal from said counter circuit means representing a predetermined count of said pulses,

generation means for generating an electric signal of an ultrasonic wave frequency in response to said pulse signal, and

transducing means for transforming said electric signal into ultrasonic waves,

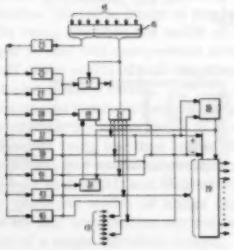
transmission of each ultrasonic wave being made within the time period of a selected one of said blanking pulses of said vertical synchronization signal and the time between transmission of said ultrasonic waves being longer than period between said blanking pulses.

4,467,363

GRAPHIC DATA COMPRESSION

James G. Tench, Jr., Lexington, Ky., assignor to International Business Machines Corporation, Purchase, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,572
Int. Cl.³ H04N 1/32
U.S. Cl. 358—261 20 Claims



1. A printing system to print visual representations of symbols communicated to said system in code bytes, said system comprising:

a printer,

means to observe one of said bytes to produce from said byte a command status defining one of at least three kinds of coding modes, a different command status being produced for each of said coding modes,

means to observe said one byte to produce from said one byte a content status defining number information, and

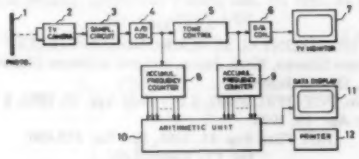
means responsive to said command status and said content status to cause said printer to print visual functions of the kind defined by said command status a number of times defined by said content status.

4,467,364

DEVICE FOR MEASURING AMOUNT OF TONE CORRECTION

Masahiko Konagaya, Kobe, Japan, assignor to Konan Camera Research Institute, Inc., Kobe, Japan

Filed Sep. 24, 1982, Ser. No. 422,826
Claims priority, application Japan, Oct. 19, 1981, 56-167346
Int. Cl.³ H04N 1/40
U.S. Cl. 358—280 2 Claims



1. A device for measuring an amount of tone correction, comprising a television camera for picking up a photographed image on a transparency as an electric video signal, a tone control circuit coupled to the output of said camera for adjusting tone of said video signal to equalize the same to desired tone of a printed image, and a monitoring television receiver coupled to the output of said tone control circuit for displaying said tone-controlled video signal; characterized in that said device further comprises means coupled to receive the input and output signals of said tone control circuit for providing a pair of accumulative frequency distributions of density of said video signal just before and after said tone control circuit, respectively, and arithmetic means coupled to the outputs of said distribution providing means for calculating differences of density between both said distributions at each accumulative frequency, said difference being said amount of tone correction between said photographed and printed images.

4,467,365

CONTROL SYSTEM FOR READING DEVICE

Tomio Murayama; Fujio Moriguchi; Masami Kurata, and Takashi Omori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1981, Ser. No. 311,357
Claims priority, application Japan, Oct. 16, 1980, 55-143651
Int. Cl.³ H04N 1/10
U.S. Cl. 358—293 10 Claims

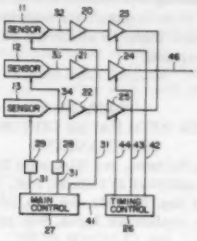
1. In a reading device of the type having a plurality of scanning type image sensors for covering a plurality of regions of an image to be read, said image sensors being disposed adjacent one another in a scanning direction and, in response to respective scanning signals, sequentially providing respective image sensor output signals which are combined into a synthetic video signal representing the read image, a control circuit comprising:

means for providing scanning signals to said plurality of image sensors during individual time intervals which collectively span a continuous time interval;

start position control means for determining a start time at which the output signal of a first of said plurality of sensors is to be provided as a part of said synthetic video signal;

set position control means for determining, in accordance

with said first start time, remaining start times at which outputs from the remainder of said plurality of sensors are provided as part of said synthetic video signal; and



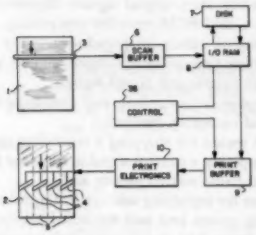
signal selection means for selecting outputs from said image sensors in accordance with the times determined by said start position and set position control means.

4,467,366

INK DROP DUPLICATING SYSTEM

Thomas W. Bobick, Richardson; Frederic L. Clark, Plano, and Suresh C. Paranjpe, Dallas, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,781
Int. Cl.³ H04M *1/22*; G01D *15/18*
U.S. Cl. 358—296 **16 Claims**



1. An ink drop duplicating system comprising:

a support member;

means for transporting a printing substrate across said support member;

a plurality of parallel and angularly extending jet drop printing heads supported adjacent said support member and collectively defining a printing region for progressive printing of a printing substrate transported therethrough, each of said printing heads comprising means for generating an angularly extending row of drop streams, deflecting means for deflecting selected ones of the drops comprising said streams in a direction perpendicular to the direction of extent of said row so as to deposit upon said printing substrate at predetermined angularly extending printing positions, drop control means responsive to a series of drop commands for selecting those of said drops which are to be so deposited, and catching means extending parallel to the direction of extent of said row for catching those of said drops which are not so selected;

sensing means for viewing a series of picture elements at side-by-side sensing positions within a strip extending across an original document and generating a series of print/no-print data bits corresponding to the picture elements so viewed;

scanning means for causing said strip to be scanned along said document so that said sensing means views all portions thereof which are to be duplicated, and

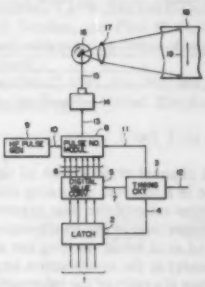
data control means for establishing a locational correspondence between said sensing positions and said printing positions, selecting said data bits in accordance with said locational correspondence and generating said drop commands in accordance with the print/no-print states of the data bits so selected.

4,467,367

HALF-TONE PICTURE RECORDING DEVICE

Yuji Ohara, and Masahiro Ohnishi, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1981, Ser. No. 258,239
Claims priority, application Japan, Apr. 30, 1980, 55-57266
Int. Cl.³ H04N *1/22*
U.S. Cl. 358—298 **8 Claims**



1. A half-tone picture recording device comprising: means for scanning a light beam onto a photosensitive recording material; means for storing values representing numbers of pulses of a predetermined width of said light beam to be applied to said recording medium for corresponding input intensity values; means for modulating said light beam in accordance with output values from said storing means outputted in response to a sequence of input values to said storing means representing the image of a picture to be recorded thereby to record the image of a half-tone picture on said recording medium; and wherein said values stored in said storing means are determined at least in accordance with:

(a) the relationship between the output density levels of the photosensitive recording material and the input density levels of the input signal;

(b) the exposure levels of said photosensitive recording material needed to produce each of said output density levels; and

(c) the number of pulses of said light source needed to produce each of said exposure levels.

4,467,368

METHOD AND MEANS FOR RECORDING AND PLAYBACK OF COLOR TELEVISION SIGNALS

Winfried Horstmann, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,731
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131853; Apr. 5, 1982, 3212665
Int. Cl.³ H04N *9/495*
U.S. Cl. 358—310 **19 Claims**

1. Method of recording color television signals comprising the steps of:

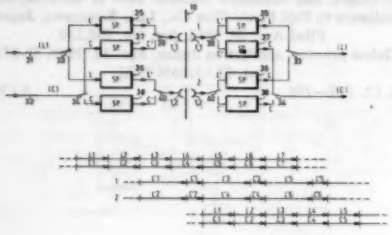
separating the luminance and chrominance components of the color television signal from each other;

distributing the luminance and chrominance signal components each into a plurality of channels, the same number of channels in each case;

time expanding the luminance signal component in each of the channels in which it is distributed;

time compressing the chrominance signal component in each of the channels in which it is distributed;

combining on a time sharing basis the luminance signal component from each of the channels in which it is distributed with the chrominance signal component from a different one, in each case, of the channels in which the chrominance signal component is distributed, and



recording each channel combination of signal components thus obtained in a separate recording channel,

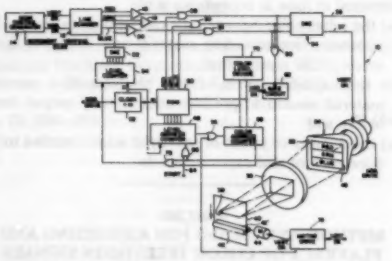
the time expansion ratio of the time expansion step and the time compression ratio of the time compression step being coordinated so as to avoid shutting out any part of either signal component in the combination step, while substantially equalizing the ratio of the information density of the recording of the respective signal components with respect to the capacity of the record medium for information density.

4,467,369

APPARATUS FOR EXPOSING PHOTOSENSITIVE MATERIAL TO VIDEO FRAME

Lawrence E. Alston, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 25, 1982, Ser. No. 352,317
Int. Cl.³ H04N *9/49*
U.S. Cl. 358—332 **24 Claims**



1. Apparatus for exposing a photosensitive material to a video frame represented by a video signal comprising:

lighting means responsive to input control signals for providing along a focused line any one colored light at a time selected from a predetermined plurality of different light colors;

means for stationing a sheet of photosensitive material along said focused line for exposure to the colored light from said lighting means;

circuit means responsive to the video signal for providing said control signals to said lighting means for varying the intensity of said colored light provided by said light means along said focused line in response to the amplitude defined by the video signal at each instant and for simultaneously selecting a colored light from said plurality of different light colors as defined by the video signal at each instant so as to expose the photosensitive material along said focused line; and

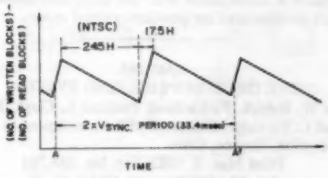
means for advancing said focused line across the photosensitive material in correspondence with each succeeding line across the video frame to which the photosensitive material is fully exposed.

4,467,370

PCM RECORDER WITH PAUSE CONTROLLED SIGNAL REARRANGING

Takashi Hoshino, Fujisawa, and Hiromichi Tanaka, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,900
Claims priority, application Japan, Sep. 26, 1980, 55-132928
Int. Cl.³ G11B *27/02*
U.S. Cl. 360—13 **12 Claims**



1. A pulse code modulation (PCM) recorder for recording incoming, time-sequence, digital signals dispersedly on a recording medium, said PCM recorder comprising:

signal rearranging means for pseudo-randomly rearranging said incoming time-sequence digital signals and for outputting said rearranged digital signals;

recording means for recording said rearranged digital signals on said recording medium;

pause switch means for stopping a recording operation;

means for supplying a control signal in response to the actuation of said pause switch means; and

transfer means for supplying said control signal to said signal rearranging means and said recording means thereby to stop and drive said signal rearranging means and said recording means synchronously.

4,467,371

METHOD OF PRE-EDITING AN ORIGINAL VIDEO TAPE IN COMBINATION OF SCENE NUMBERS WITH A CARD AND SYSTEMS FOR CARRYING OUT THE METHOD

Yosoji Kobayashi, Kanagawa; Yoshitaka Kato, Tokyo; Kyoichi Tokiwa, Tokyo; Yukinori Yoneda, Tokyo; Hiroyuki Maie, Tokyo; Minoru Tamagami, Tokyo; Shoji Motohashi, Tokyo; Tatsuo Konishi, Tokyo, and Shigeru Araki, Tokyo, all of Japan, assignors to Nippon Television Network Corp. and Nippon Electric Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 169,366, Jul. 16, 1980, abandoned. This application Apr. 18, 1983, Ser. No. 484,300
Int. Cl.³ H04N *5/782*; G11B *27/08, 27/10*
U.S. Cl. 360—14.3 **1 Claim**

1. A method of rearranging a sequence of first scenes into a sequence of second scenes by the use of a first and a second video tape and a television camera having a start button, said second scene sequence being formed by selecting said first scene sequence, said method comprising the steps of:

producing said first scenes for each operation of said start button;

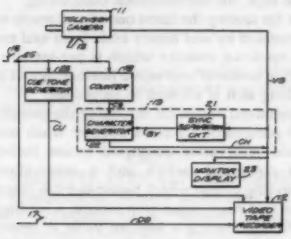
producing a scene number each time said start button is operated, said scene numbers being in one-to-one correspondence to said first scenes;

recording said first scenes together with the corresponding scene numbers on said first video tape;

preparing a card having thereon a sequence of successive numbers which are in one-to-one correspondence to said scene numbers;

displaying said successive scenes together with the corresponding ones of said scene numbers;

putting a mark on said card with reference to the scene number displayed together with each of said successive scenes to provide a marked card;



comparing said first video tape with said marked card to select coincident scene numbers which are coincident with the marks put on said marked card;

selecting said second scene sequence from the first scene sequence recorded on said first video tape in accordance with said coincidence scene numbers; and

recording said second scene sequence on said second video tape.

4,467,372

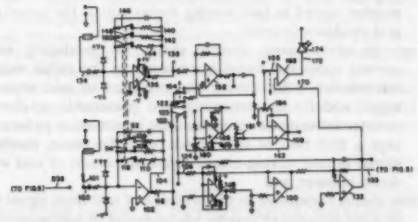
SIGNAL MONITORING INSTRUMENT

George G. Juodenas, Rte. 2, Greenbriar, Tenn. 37073

Filed Oct. 2, 1981, Ser. No. 308,040

Int. Cl.³ G11B *15/02*

U.S. Cl. 360—31 **21 Claims**



1. A signal monitoring circuit for use in adjusting an external power source to produce a preselected output voltage level, the external power source having an adjustment mechanism for adjusting the voltage level of the output signal thereof, comprising:

an input for receiving the output signal of the external power source;

first oscillator means connected to said input for producing a first oscillator signal having a frequency that is directly proportional in magnitude to the voltage level of the output signal of the external power source;

reference oscillator means for producing a reference oscillator signal having a frequency that is equal to the first oscillator signal when the output signal applied to said input is at a preselected reference voltage level;

mixer means for receiving and mixing the first oscillator signal and the reference oscillator signal to produce a mixed signal;

audio means responsive to the mixed signal for producing an audible sound corresponding to the first oscillator signal and the reference oscillator signal so that the audible sound will include first and second tones that will produce a beat sound when the first and second tones are within a predetermined frequency range, the beat sound having a frequency that is proportional to the frequency difference between the first and second tones so that the voltage level of the output signal may be adjusted to correspond to the preselcted output voltage level by adjusting the output voltage level of the external power source so that the beat sound has a zero frequency.

4,467,373

STORAGE AND RETRIEVAL OF DIGITAL DATA ON VIDEO TAPE RECORDERS

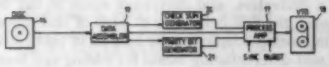
Richard J. Taylor, London, and Paul R. N. Kellar, Newbury, both of England, assignors to Micro Consultants Limited, Berkshire, England

Filed Oct. 7, 1981, Ser. No. 309,304

Claims priority, application United Kingdom, Oct. 9, 1980, 8032631

Int. Cl.³ H04N *5/782, 5/94*

U.S. Cl. 360—38.1 **9 Claims**



1. A video data transfer system which includes a source of digital video signals in bit-serial mode, means for interspersing television line period synchronising signals in said serial mode digital video signals so that said signals can be recorded on magnetic tape by means of a video tape recorder, means for providing, in certain line periods separated from each other by a plurality of line periods occupied by said digital video signals, parity bit signals which relate respectively to the plurality of bits of the digital signals occurring at corresponding positions in a plurality of adjacent line periods, and means for providing, in each line period, a digital error check code signal related to the digital video signals or parity bit signals occurring in the respective line period, said parity bit signals and said error check code signals facilitating the subsequent detection of drop outs which might occur on recording the various signals on magnetic tape and their replay therefrom.

4,467,374

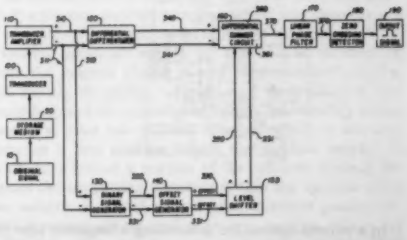
METHOD AND MEANS FOR DIRECT-CURRENT POLARITY RESTORATION IN MAGNETIC RECORDING

Robert M. Batey, and Peter J. Petroski, both of Eagle, Id., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Apr. 5, 1982, Ser. No. 365,661

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—46 **2 Claims**



1. An apparatus for restoring the direct-current component

of a signal read from a storage medium, said apparatus comprising:

first means responsive to a transducer signal for providing first and second signal states having first and second polarity levels, respectively, said first and second signal states having leading and trailing transition portions;

second means coupled to the output of said first means for providing first and second binary signals in response to said first and said second signal states, respectively;

third means coupled to the output of said second means and responsive to said first and second binary signals for providing a first positive and a first negative offset signal, said first positive offset signal commencing on the trailing edge of said second binary signal and terminating on the leading edge of said first binary signal, said first negative offset signal commencing on the trailing edge of said first binary signal and terminating on the leading edge of said second binary signal;

fourth means coupled to the output of said third means for converting said first positive and first negative offset signal to a second positive and a second negative offset signal, respectively, and for shifting the output level of said second positive and said second negative offset signals to predetermined levels;

differentiating means coupled to receive each of said first and second signal states from said first means for providing a derivative, said derivative equal to the difference between the first derivative of each of said signal states;

summing means coupled to the outputs of said fourth means and said differentiating means for adding said level-shifted second positive offset signal to the derivative of said first signal state and said level-shifted second negative offset signal to the derivative of said second signal state, respectively, to produce first and second composite signals, said first and second composite signals summed differentially to provide a reconstructed signal;

detector means coupled to the output of said summing means for providing a signal output in response to a zero crossing of said reconstructed signal.

4,467,375

MUSIC RESERVATION DEVICE FOR USE WITH MAGNETIC TAPE PLAYBACK APPARATUS

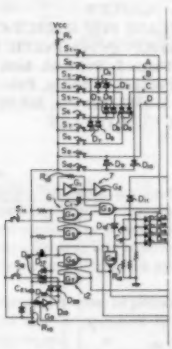
Takashi Sato, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Kawagoe, Japan

Filed Jul. 29, 1981, Ser. No. 288,151

Claims priority, application Japan, Jul. 31, 1980, 55-105383

Int. Cl.³ G11B *15/18*

U.S. Cl. 360—72.1 **7 Claims**



1. In a control system for controlling a magnetic tape playback apparatus which is adapted to play back a magnetic tape set therein via a play-back head thereof in response to a play-back command signal and to advance said tape either forwardly or reversely while engaging the head against the tape in response to a forward or reverse command signal, which control system comprises music number signal producing means for producing a music number signal representing a number of one piece of music recorded on the magnetic tape to be played back when manually operated, said music producing means including a plurality of manually operated switches and an encoder for producing a binary code signal corresponding to the position of at least one of said switches, and a music intermission pulse generator for generating a music intermission pulse when the play-back head passes an intermission zone of said magnetic tape, the improvement comprising:

storing means for storing the latest one of said music number signal represented by said binary code from said encoder;

a presettable up-down counter which is pre-set at a count corresponding to one of said music number signals applied thereto as long as it is allowed to be pre-set;

reservation command means for inhibiting the preset operation of said presettable up-down counter when manually actuated said reservation command means including a reservation command switch and a reservation stop switch, a flip-flop circuit which becomes set in response to actuation of said reservation stop switch, a loading pulse generator for generating a loading pulse in response to said binary code signal, a gate for passing said loading pulse therethrough to said up-down counter when the flip-flop circuit is set and said up-down counter being a binary counter adapted to be preset by said binary code signal during the presence of said loading pulse that is passed through said gate;

comparing means for comparing the music number stored in said storing means with the count of said preset-table up-down counter and including means for producing a first signal when the music number is larger than the count, a second signal when the music number is smaller than the count and a third signal when the music number equals the count;

forward advancement control means for producing said forward command signal in response to the initial music intermission pulse during the presence of said first signal and for incrementing said presettable up-down counter in response to each music intermission pulse until the music number stored in said storing means equals the count of said up-down counter;

reverse advancement control means for producing said rewind command signal in response to the initial music intermission pulse during the presence of said second signal and for decrementing said presettable up-down counter in response to each music intermission pulse except a first two of said pulses until the music number stored in said storing means equals the count of said up-down counter; and

stop means responsive to the presence of said third signal to stop the forward or reverse advancement of said magnetic tape set.

4,467,376

PROCESS FOR THE RECORDING ON, AND READING OF, STORE TAPES

Walter Jaeger, Cureglia, Switzerland, assignor to GX-Holding AG., Switzerland

Filed Dec. 1, 1981, Ser. No. 326,337

Claims priority, application Switzerland, Dec. 2, 1980, 8900/80

Int. Cl.³ G11B *5/08, 15/60*

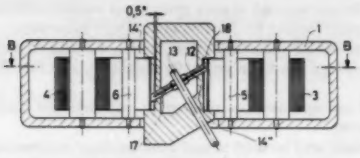
U.S. Cl. 360—84 **5 Claims**

1. Apparatus for the recording on, and reading of, a magnetic tape comprising:

recording and reading heads which are arranged on a disk which revolves around a common axis extending obliquely with respect to the travel direction of said tape, tape transport means; and

guiding means of elliptical cylindrical form having major

and minor elliptical axis and longitudinal axis, with guiding means surrounding said recording heads, said longitudinal axis being perpendicular to the direction of tape



transport, said recording and reading heads interacting with the tape through a slot-shap4d aperature provided in said guiding means.

4,467,377

CASSETTE TYPE-TAPE RECORDER

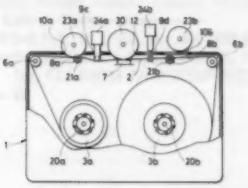
Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,319

Claims priority, application Japan, Dec. 29, 1980, 55-187928[U]

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—96.1 **5 Claims**



1. In a cassette tape machine including at least one pinch roller for engaging a tape in a cassette, having a supply reel, a take-up reel and associated guide rollers, so as to advance said tape from said supply reel to said takeup reel, said machine further comprising a magnetic head for contacting said tape, the improvement comprising an additional roller insertable from said tape machine into said cassette for contacting said tape at a point between said magnetic head and one of said associated guide rollers.

4,467,378

TWO STEP CASSETTE RETURN MECHANISM FOR CASSETTE TAPE DECKS

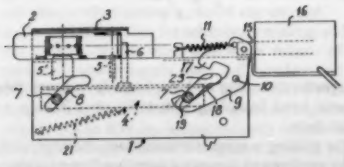
Etienne A. Schatteman, Wemmel, Belgium, assignor to Staar S. A., Brussels, Belgium

Filed Nov. 16, 1981, Ser. No. 321,797

Claims priority, application Belgium, Nov. 19, 1980, 886.248

Int. Cl.³ G11B *5/008, 15/00, 15/32;* G03B *1/04*

U.S. Cl. 360—96.5 **8 Claims**



1. A tape deck for cassettes, said tape deck having a fixed frame, guide means for guiding a cassette in its forward and return movement between original and operative positions, a movable frame mounted for forward and return movement, drive members on said movable frame which penetrate and engage said cassette in the course of movement to operative position and retract upon return movement, means connecting said movable frame to return the cassette on return movement of said movable frame, the improvement in said tape deck comprising:

a latch element on said movable frame;

latch means on said fixed frame for engaging said element and holding said movable frame in operative position;

means for disengaging said latch means from said element to release said movable frame and permit the return movement of said movable frame toward the original position; and

means on said fixed frame for momentarily interrupting the return movement of said movable frame in the course of said movement to provide a two step return of the cassette.

4,467,379

RECORDING AND/OR REPRODUCING DEVICE MAKING USE OF A CASSETTE

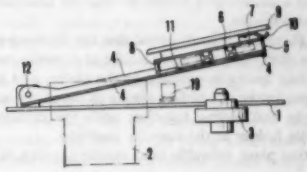
Takashi Itani, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,288

Claims priority, application Japan, Dec. 9, 1980, 55-174123

Int. Cl.³ G11B *5/008, 15/00, 17/00*

U.S. Cl. 360—96.5 **7 Claims**



1. A recording and/or reproducing apparatus arranged to use a record bearing medium supported by a pair of supporting members within a cassette, said apparatus comprising:

(A) recording and/or reproducing means for recording signals on and/or reproducing signals from the record bearing medium;

(B) receiving means for receiving therein the cassette, said receving means being movable between a first position where the receiving means receives the cassette from a predetermined direction and a second position where the receiving means places the received cassette at a predetermined position for the signal recording and/or reproduction and having:

(B-1) a chamber for accommodating the cassette, said chamber having an opening for enabling the cassette to be inserted into the chamber from said direction; and

(B-2) a stopper member provided within said chamber at a position beyond said opening in said direction;

(C) loading means for pulling out a portion of the medium from the cassette placed at said predetermined position and loading the pulled out portion of the medium on said recording and/or reproducing means, said loading means having at least one pull-out member which is movable between a first position where the pull-out member is positioned behind a portion of the medium strained between the supporting members within the cassette when the cassette is placed at said predetermined position by said receiving means and a second position where the pull-out member pulled out a portion of the medium from the cassette; and

(D) urging means for urging the cassette accommodated at

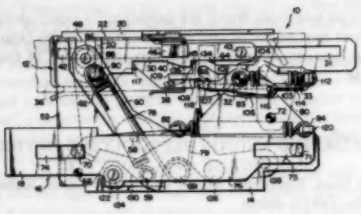
said chamber of said receiving means against said stopper member along said direction before the cassette is placed at said predetermined position by the receiving means.

4,467,380

CASSETTE LOADING/UNLOADING APPARATUS FOR CASSETTE TAPE RECORDER

Toshikazu Kato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,328
Claims priority, application Japan, Feb. 24, 1981, 56-25921
Int. Cl.³ G11B 5/008, 15/00, 15/32; G03B 1/04
U.S. Cl. 360—96.5 8 Claims



1. In a cassette loading/unloading apparatus for a slot-in type cassette tape recorder using a toggle spring, wherein a cassette is inserted into the tape recorder with a pushing-in stroke and a drawing-in stroke at cassette insertion, the improvement wherein;

the toggle spring is so disposed that the drawing-in stroke is larger than the pushing-in stroke at cassette insertion,

an ejecting spring is coupled to the slider, and is disposed independently of a sliding stroke of the slider containing a cassette and sliding together with the cassette inside a cassette holder at the cassette insertion,

an ejecting plate, movable in an ejecting stroke, is provided, and

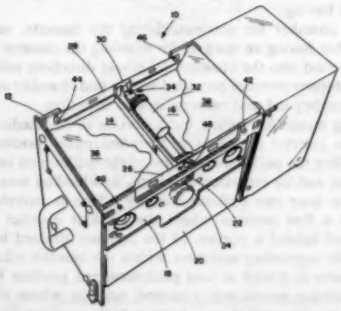
a biasing force is charged in the ejecting spring in concert with the ejecting stroke of the ejecting plate at cassette ejection, thereby applying an ejecting force to the slider.

4,467,381

TAPE RECORDER HEAD MOVING MECHANISM

Arse M. Harja, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., unit of Sundstrand Corporation, Redmond, Wash.

Filed Oct. 24, 1980, Ser. No. 200,287
Int. Cl.³ G11B 5/48, 5/55, 21/16, 21/08
U.S. Cl. 360—106 9 Claims



1. A tape deck comprising:

magnetic tape including a first and a second set of tracks;

tape transport means for moving said tape in a predetermined direction;

a support structure secured to said tape transport means;

a first flexure secured at each end to said support structure generally parallel to the direction of tape movement;

a second flexure secured at each end to said support structure spaced apart and generally parallel to said first flexure;

a head carriage member secured to said first and second flexures;

a magnetic head secured to said head carriage member such that said magnetic head is disposed to the first set of said tape tracks; and

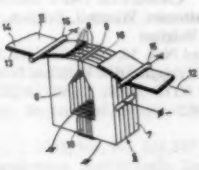
means secured to both said base member and said head carriage member for moving said carriage in a direction perpendicular to the direction of tape movement resulting in the magnetic head moving from one of said set of tape tracks to the other.

4,467,382

MAGNETIC RECORDING AND PLAYBACK DEVICE HAVING MEANS FOR REDUCING HEAD CORROSION

Hendrikus F. Huisman, Oosterhout, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,499
Claims priority, application Netherlands, Dec. 2, 1980, 8006544
Int. Cl.³ G11B 5/12
U.S. Cl. 360—125 9 Claims



1. A magnetic recording and playback device, comprising:

a magnetic head including a metallic core having a tape contact face;

means for guiding a magnetic tape along the face, and

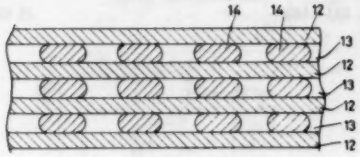
means for applying to the core a negative direct voltage with respect to ground potential, whereby corrosion of the core during contact with a magnetic tape is decreased.

4,467,383

MAGNETOOPTIC MEMORY MEDIUM

Kenji Ohta, Yao; Toshihisa Deguchi, and Akira Takahashi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1981, Ser. No. 237,083
Claims priority, application Japan, Feb. 23, 1980, 55-21910; Feb. 27, 1980, 55-25980; Apr. 9, 1980, 55-47362
Int. Cl.³ G11B *13/04;* G11C *13/06*
U.S. Cl. 360—131 19 Claims



1. A magnetic storage medium, comprising:

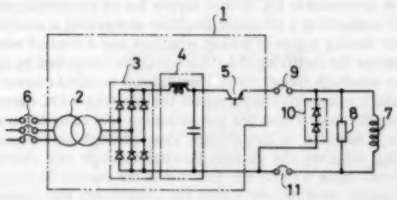
a layer of magnetic material having changeable and readable amorphous magnetic memory locations and permanent crystalline memory locations.

4,467,384

PROTECTIVE DEVICE FOR DC REGULATED POWER SUPPLIES FOR SUPERCONDUCTING MAGNET COILS

Kazunori Yuasa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,411
Claims priority, application Japan, Feb. 10, 1982, 57-21501
Int. Cl.³ H02H *7/00;* H01F *7/22*
U.S. Cl. 361—19 4 Claims



1. A protective circuit for use with a DC regulated power supply supplying DC current to a superconducting magnet coil, comprising:

(a) an AC breaker connected to the DC regulated power supply for controlling an AC input current to the latter;

(b) a resistance connected in parallel with the superconducting magnet coil for absorbing energy stored therein;

(c) a first DC breaker for cutting off an output current from said DC regulated power supply;

(d) flywheel diode means connected in parallel with the superconducting magnet coil for absorbing energy stored therein when said DC regulated power supply fails, said flywheel diode means and said superconducting magnet coil selectively forming a closed circuit; and

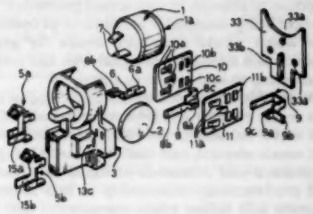
(e) a second DC breaker for selectively making and breaking said closed circuit, such that upon failure of said DC regulated power supply, said AC breaker and said first DC breaker are energized to allow said flywheel diode means to absorb the energy stored in said superconducting magnet coil to thereby instantaneously reduce the current flowing through said DC regulated power supply, and such that when said superconducting magnet coil or said flywheel diode means fails, said AC breaker and said first and second DC breakers are energized to allow said resistance to absorb the energy stored in said superconducting magnet coil.

4,467,385

SUPPLY AND PROTECTION UNIT FOR A HERMETIC COMPRESSOR

Fulvio Bandoli, and Edoardo Chiarelli, both of Turin, Italy, assignors to Aspera S.p.A., Castelnuovo Don Bosco, Italy

Filed Jul. 15, 1982, Ser. No. 398,467
Claims priority, application Italy, Aug. 7, 1981, 53530/81[U]
Int. Cl.³ H02H *7/085*
U.S. Cl. 361—24 12 Claims



1. A supply and protection unit for connecting to an electrical power supply source the windings of an electric motor of a hermetic compressor of a refrigerator, a control thermostat being interposed between said windings for regulating the supply of power, said unit comprising:

an electrically insulating support body adapted to be fixed to the casing of the compressor, said support body being provided with cavities opening at one of its faces intended to face towards the compressor casing,

a first and second electrical device slidably and removably inserted in a first one and a second one of said cavities, respectively; said first device being a thermally operated protection switch and said second device being a resistor with a positive temperature coefficient (PTC), wherein the protection switch is disposed in said first cavity so that, with the body fixed to the compressor casing, a heat sensitive face of the switch is applied to the casing itself, and

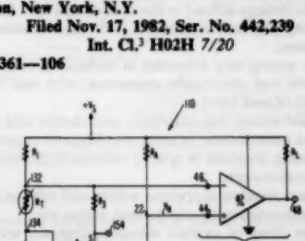
connection means for the electrical connection of an electrical power supply source to said windings of the electric motor of the compressor and to said control thermostat of the compressor.

4,467,386

FAIL-SAFE SENSOR CIRCUIT

Richard A. Wasson, Mount Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1982, Ser. No. 442,239
Int. Cl.³ H02H *7/20*
U.S. Cl. 361—106 6 Claims



1. A circuit for supplying a control signal comprising:

means for generating a measurement signal representative of a parameter to be sensed;

means for providing a reference signal which is substantially independent of said parameter; and

comparison means for comparing said reference signal and said measurement signal for producing said control signal with a first value when said measurement signal has a predetermined relationship to said reference signal and producing said control signal with a different value when said measurement signal does not have said predetermined relationship to said reference signal; and

said means for generating including a sensor element and switchable impedance means;

said sensor element having an impedance which varies in response to changes in said sensed parameter, said sensor element being susceptable to failure in an operating condition which would cause said means for generating to produce said measurement signal with said predetermined relationship to said reference signal;

said switchable impedance means connected in circuit with said sensor element and responsive to only said failure in said sensor element for providing a load impedance across said sensor element, said load impedance being of a value to produce said measurement signal that does not have said predetermined relationship to said reference signal whereby said failure mode operation of said sensor element is prevented from causing said comparison means to produce said control signal with said first value.

4,467,387

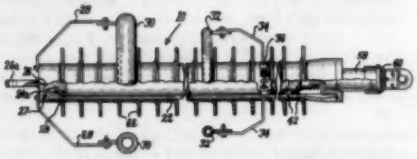
COMBINATION STRUT INSULATOR AND LIGHTNING ARRESTER

Daniel D. Bergh, Lenox; Robert E. Koch, and John A. Timoshenko, both of Pittsfield, all of Mass., assignors to General Electric Company, King of Prussia, Pa.

Filed Sep. 30, 1982, Ser. No. 429,711

Int. Cl.³ H02H 9/06; H01T 1/16; H01B 17/46

U.S. Cl. 361—132 **10 Claims**



1. An integrated structure for insulatively supporting an aerial high voltage transmission line from a grounded tower and for absorbing the energy associated with lightning strikes to the transmission line and tower, said integrated structure comprising, in combination:

A. an elongated, insulative tube of high mechanical strength;

B. metallic fittings affixed to the ends of said tube for accommodating physical connection with the transmission line and tower;

C. a first arcing ring mounted in embracing relation with said tube and electrically connected with said fitting at one end of said tube;

D. a second arcing ring externally mounted to said tube at a location intermediate its ends, said first and second arcing rings being disposed in spaced relation to provide an arc gap therebetween;

E. a contact member supported within said tube and electrically connected with said second arcing ring;

F. a series array of varistor elements disposed within said tube in electrical connection between said contact member and said fitting at the other end of said tube;

G. a plurality of weather sheds covering the exterior surface of said tube over a substantial portion of its length;

H. whereby in use the integrated structure will insulatively support the transmission line in spaced relation from the tower by said tube and said varistor array will function to absorb any lightning induced voltage surges of sufficient magnitude to break down said arc gap.

4,467,388

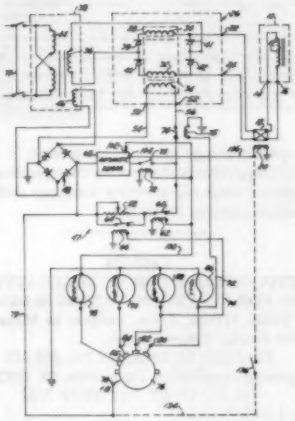
ELECTROMAGNETIC CHUCK POWER SUPPLY AND CONTROLLER

James H. Thoe, Alma, Mich., assignor to Hitachi Metals International Ltd., White Plains, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,108

Int. Cl.³ H01F 13/00

U.S. Cl. 361—145 **15 Claims**



1. A controllable DC power supply for an electromagnetic chuck comprising a magnetic amplifier comprising a saturable reactor having a pair of power windings and a control winding, means for rectifying the electrical current supplied by said power windings, means for connecting said rectified current to said electromagnetic chuck, means for applying a DC current across said control winding for saturating said saturable reactor as a function of the current flow through said control winding whereby the current flowing through said electromagnetic chuck is an inverse function of the current flowing in said control winding, and means for controllably and momentarily reversing current flow through said electromagnetic chuck.

4,467,389

MAGNETIC TAPE DEGAUSSER AND METHOD OF ERASING MAGNETIC RECORDING TAPE

Roger W. Knipp, Fountain Valley, Calif., assignor to Christie Electric Corp., Torrance, Calif.

Filed Mar. 26, 1982, Ser. No. 362,470

Int. Cl.³ H01F 13/00

U.S. Cl. 361—151 **5 Claims**

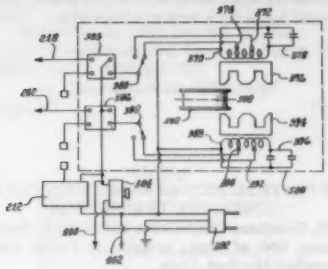
1. A magnetic tape degausser for erasing information encoded on a magnetic tape, said degausser comprising:

first and second means for generating flux for erasing said magnetic tape;

means for automatically conveying said magnetic tape towards and away from said first and second means for generating flux; and

means for selectively actuating said first and second means for generating flux so that flux is produced only by said first means when said tape is conveyed towards said first and second means for generating flux, and so that flux is produced by both said first and second means only when said tape is proximate said first and second means for generating flux and as said tape is conveyed away from

said first and second means for generating flux to a predetermined location, thereby reducing the undesired production of heat,



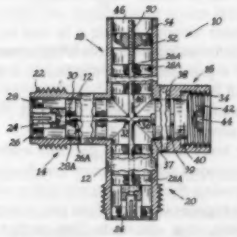
said means for selectively actuating including means for sensing the location of said tape and terminating flux production when said tape is at said predetermined location away from said first and second means for generating flux.

4,467,390

LIGHTNING PROTECTOR AND FILTER

Roy B. Carpenter, Jr., 9444 Terra Bianca, Whittier, Calif. 90603

Filed Aug. 6, 1982, Ser. No. 406,019
Int. Cl.³ H02H *9/06*
U.S. Cl. 361—56 **1 Claim**



1. A lightning protector and filter comprising in combination:

a substantially tubular shell structure of an electrically conductive material having in angular and integral displacement and in a plane a first, a second, a third and a fourth substantially tubular leg structure,

said first tubular leg structure suitable for the connection with the outer conductor of an incoming two-conductor coaxial circuit and cable,

a first center conductor positioned axially within said first tubular leg structure and extending from the geometric tubular center of said tubular shell structure to the end of said first tubular leg structure,

a female coaxial-type sleeve mounted on and connected with the end of said first center conductor,

said sleeve and said center conductor supported by at least one dielectric spacer,

said fourth tubular leg structure suitable for the connection with the outer conductor of an outgoing two-conductor coaxial circuit and cable,

a fourth center conductor positioned axially within said fourth tubular leg structure and extending from the geometric tubular center of said tubular shell structure to the end of said fourth tubular leg structure,

a female, coaxial-type sleeve mounted on and connected with the end of said fourth center conductor,

at least one dielectric spacer supporting said sleeve and said center conductor within said fourth tubular leg structure,

a second center conductor having two ends and supported by at least one dielectric spacer,

a gas-filled tube having two terminals,

a resistance disc having a top and a bottom surface,

a plug made of brass having a flat bottom and a slotted top surface,

said second center conductor, said gas-filled tube, said resistance disk and sid plug mounted axially and in this sequence from the geometric tubular center of said shell structure within said second tubular leg structure,

said second center conductor connected with one of its two ends to said first and said fourth center conductor and with its other end to one of the two terminals of said gas-filled tube,

the second terminal of said gas-filled tube connected to the bottom surface of said resistance disc,

the top surface of said resistance disc in contact with the bottom surface of said plug,

said plug in contact with said second tubular leg structure,

a third center conductor having one plain and one threaded end portion, positioned axially within said third tubular leg structure and supported by at least one dielectric spacer and connected with its plain end with said first, said second and said fourth center conductor and extending from the geometric tubular center of said shell structure to the end of said third tubular leg structure,

a stub made of an electrically conductive material having an exposed top and a bottom and an internal thread formed axially therein and at least one recess formed in its exposed top,

said stub mounted on and engaging with its thread the end of said third center conductor and thereby making contact with the inside surface of said third tubular leg structure,

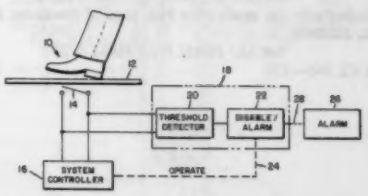
said at least one recess serving for the engagement with a suitable tool for the positioning of said internally threaded stub on said threaded end of said third center conductor for the adjustment of the impedance of said lightning protector and filter corresponding to a specific operational wave length and a discrete fraction thereof.

4,467,391

MONITOR FOR AN ELECTRICALLY-CONTROLLED SYSTEM

Brian G. Refoy, 1104 Ridgeway Cir., Richardson, Tex., and Earnest E. Taylor, 3615 Harvard Ave., Dallas, Tex.

Filed Dec. 28, 1981, Ser. No. 335,198
Int. Cl.³ H01H *47/12*
U.S. Cl. 361—179 **20 Claims**



1. A monitor for an electrically controlled system comprising:

(a) a switch having a voltage impressed thereacross;

(b) means for sensing the voltage signal across said switch in the open and closed positions; and

(c) means for disabling the electrically-controlled system if said sensed voltage signal in one of either the open or closed positions does not vary from the sensed voltage

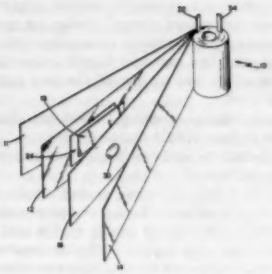
level in the other of the closed and open positions by a predetermined voltage limit.

4,467,392

CAPACITOR RESISTOR

Frederick W. MacDougall, Marion, Mass., assignor to Aerovox Incorporated, New Bedford, Mass.

Filed Aug. 30, 1982, Ser. No. 412,572
Int. Cl.³ H01G 1/11
U.S. Cl. 361—275 **8 Claims**



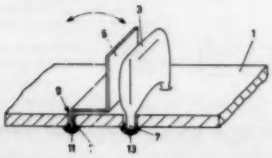
1. A capacitor comprising, in combination,
a first and a second electrode strip separated by a dielectric strip, said electrode strips and said dielectric strip being wound in a roll, said dielectric strip having an opening therethrough between said electrode strips, and
a discharge resistor strip mounted between said first electrode strip and said dielectric strip at said opening,
one surface of said resistor strip having a portion in electrical contact with said second electrode strip through said opening,
the opposite surface of said resistor strip having no more than a portion in electrical contact with said first electrode strip, said portion being spaced along said resistor strip from said opening, and
insulating means extending between said first electrode strip and said resistor strip except at said portion of said resistor strip in electrical contact with said first electrode strip.

4,467,393

TRIMMING CAPACITOR

Karl H. Kupfer, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,534
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206920
Int. Cl.³ H01G 3/16; H03J 3/20
U.S. Cl. 361—278 **1 Claim**



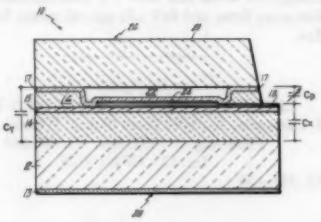
1. An electronic circuit with a trimming capacitor consisting of a flexible metal lug as a first electrode and a rigid counter electrode, said metal lug being arranged in confronting relationship with said counter electrode, characterized in that:
said counter electrode is formed by a plate capacitor rigidly connected to an insulating support;
said metal lug being bendable for varying the capacitance of the trimming capacitor;
said metal lug being soldered to said insulating support; and
said metal lug being a strip of a band of tin.

4,467,394

THREE PLATE SILICON-GLASS-SILICON CAPACITIVE PRESSURE TRANSDUCER

Daniel H. Grantham, Glastonbury, and James L. Swindal, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,531
Int. Cl.³ H01G 7/00; G01L 9/12
U.S. Cl. 361—283 **15 Claims**



1. A pressure transducer for providing a manifestation of the magnitude of a pressure signal applied to a pressure sensing surface thereof comprising:
first and second silicon pieces, said first piece including a pressure sensing surface; and
a dielectric body mounted at opposite ends thereof to said first and second silicon pieces and having an electrode with opposing first and second major surfaces disposed therein in register with said first and second silicon pieces, respectively, said electrode first surface and said first silicon piece disposed at opposite ends of an aperture formed in said dielectric body to provide a pressure responsive capacitance having an instantaneous value in dependence on, and in manifestation of, the magnitude of pressure signal applied to said first silicon piece pressure sensing surface.

4,467,395

AC METALLIZED CAPACITOR AND IMPREGNANT THEREFOR

Sidney D. Ross, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

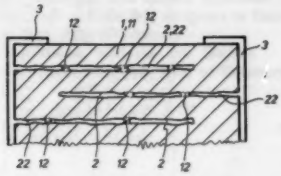
Filed Feb. 25, 1983, Ser. No. 469,553
Int. Cl.³ H01B 3/20
U.S. Cl. 361—315 **7 Claims**

1. An AC metallized film capacitor comprising a contiguously wound metallized film capacitor section impregnated with an ester dielectric fluid containing 2 to 10% of an N,N-substituted carbodiimide as additive to improve AC life by enhancing capacitance retention under AC conditions.

4,467,396
MONOLITHIC CAPACITOR AND METHOD OF MANUFACTURING IT

Gerhard Leupold, and Hans Hoppert, both of Selb, Fed. Rep. of Germany, assignors to Draloric Electronic GmbH, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,411
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210016; Mar. 2, 1983, 3307231
Int. Cl.³ H01G 4/12; C04B 35/46
U.S. Cl. 361—321 11 Claims

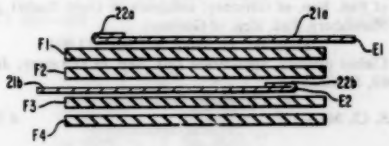


1. A monolithic capacitor comprising an insulation body of a densely sintered dielectric ceramic material having electrically conductive layers interleaved parallel to and spaced from each other, which layers are formed in hollow spaces provided in layer regions in the dielectric material into which electrically conductive material is incorporated, which layers extend alternately up to one of two opposite outer surfaces of the insulating body where they are electrically combined by connections each forming one of the two plates of the capacitor, and the edge of which opposite outer surface extends spaced in each case from the opposite outer surface of the ceramic body, the electricly conductive layers being layers interposed in the dielectric material and of a porous ceramic material having a network of interconnected pores within which the conductive material is located, the ceramic material of the insulting body being a known semiconductor ceramic having a base of strontium titanate with intergrain insulation.

4,467,397
MULTI-SECTION POWER CAPACITOR WITH ALL-FILM DIELECTRIC

Peter H. Thiel; George E. Mercier, and Michael D. Pruett, all of Bloomington, Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 18, 1981, Ser. No. 293,788
Int. Cl.³ H01G 4/38, 4/06
U.S. Cl. 361—328 9 Claims



1. A power capacitor comprising:

a plurality of wound capacitor sections in an enclosure having first and second terminals extending through the enclosure;

each of said capacitor sections comprising first and second foil electrodes and one or more sheets of dielectric material between said electrodes on both sides of said respective electrodes, said dielectric material consisting essentially of plastic film material, said pair of foil electrodes being laterally offset from each other and from said sheets of dielectric material within each of said wound sections to provide a first edge of said first electrode extending from the edge of said dielectric material at a first end of said wound section and a second edge of said first electrode confined between two of said sheets of dielectric material, and a first edge of said second electrode extending from the edge of said dielectric material at a second end of said wound section and a second edge of said second electrode confined between two of said sheets of dielectric material, said extended first edge of said first electrode and said extended first edge of said second electrode so extending over substantially the entire length of said electrodes in said section;

said second edges of each of said first and second electrodes being rounded and smmoth and each being the exterior of a fold of the material of said foil electrodes;

each of said capacitor sections having a space factor over the intermediate portion thereof between said second edges of said electrodes of from about 1.25 to about 1.35 as determined by the ratio of the distance between said pair of foil electrodes to the thickness of said dielectric material therebetween and having a space factor at said second edges of from about 1.15 to about 1.25;

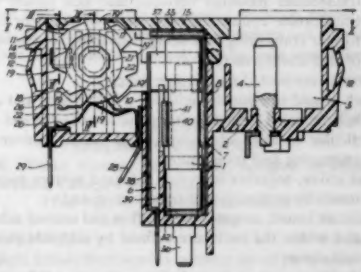
said plurality of wound capacitor sections being assembled in a stack within said enclosure with ends of said sections being substantially aligned; available space within said enclosure, including the interior of each of said sections, being substantially filled with a liquid dielectric impregnant;

connection means for selectively connecting said foil electrodes of said sections with each other and with said terminals, said connection means comprising areas of deposited metal disposed on end surfaces of said stack of sections and contacting a substantial portion of said extended electrode edges, and conductive leads connected between certain ones of said areas of deposited metal and said terminals.

4,467,398
UNIT PLUG

Edwin Weber, Gärtringen, Fed. Rep. of Germany, assignor to Kautt & Bux KG, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,708
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127306
Int. Cl.³ H02B 1/04
U.S. Cl. 361—331 19 Claims



1. A plug for an electrically operated device combined with a voltage selector and a fuse supporting device to form one component, comprising: said voltage selector having a roller-like actuating member which is rotatably adjustable to different angular positions;

said voltage selector further including movable contact and counter-contact pieces, said contact pieces, depending upon the angular position of said actuating member, are held in different combinations by said actuating member against appropriate counter-contact pieces of said voltage

selector for actuating different combinations of contact pieces for different voltages;

said fuse supporting device has at least one fuse holder, exchangeably mounted in the fuse supporting device, for holding a fine-wire fuse; and

said fuse supporting device further having contact pieces against which the contact caps of said fine-wire fuse rest when said fine-wire fuse is inserted into said fuse holder.

4,467,399

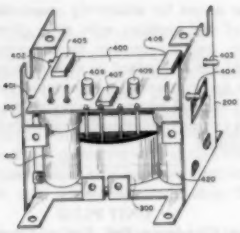
POWER SUPPLY PACKAGING ARRANGEMENT

Hendrik W. Van Husen, Glen Ellyn, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 18, 1981, Ser. No. 332,138

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—379 **7 Claims**



1. A power supply packaging arrangement for use with electrical equipment, said power supply packaging arrangement comprising:

first and second side panels each including a pair of transformer connecting tabs extending perpendicular therefrom, and spaced apart and parallel to each other;

a transformer mounted between said side panels via said transformer connecting tabs, each of said pair of transformer connecting tabs being connected to opposite sides of said transformer;

a cover connected to said side panels;

each of said side panels including a lower edge and a partial bottom panel extending from said lower edge and perpendicular to said side panels, said partial bottom panels embracing said transformer;

said cover, together with said side and bottom panels substantially enclosing said transformer; and

a circuit board, mounted to said first and second side panels and within the enclosure defined by said side panels and said cover;

said side panels each including a locating tab extending therefrom, whereby movement of said transformer in a plane parallel to said side panels is restricted by said partial bottom panels and said locating tabs;

said circuit board including at least one circuit board mounting tab extending from opposite edges of said circuit board, said side panels each including at least one circuit board mounting tab receptacle, whereby said circuit board is mounted to said side panels by inserting said circuit board mounting tabs into said circuit board mounting tab receptacles.

4,467,400

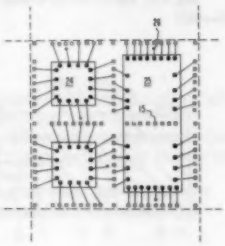
WAFER SCALE INTEGRATED CIRCUIT

Herbert Stopper, Orchard Lake, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 225,580, Jan. 16, 1981,. This application May 13, 1982, Ser. No. 378,023

Int. Cl.³ H05K *01/18*

U.S. Cl. 361—403 **15 Claims**



1. A wafer scale integrated circuit which incorporates integrated circuit die of different sizes; comprising:

a semiconductor wafer having a major surface;

patterned metal layers over said surface which define an array of uniformly sized cells for receiving and interconnecting said die;

said cells having main bonding pads around their edges, auxiliary bonding pads in their interior, and conductors which connect each auxiliary bonding pad to a respective main bonding pad to form auxiliary-main bonding pad pairs;

a plurality of said different-sized die arranged over said cells such that several large die occupy respective spaced apart areas on said surface, the spaces between said large die being smaller than the large die themselves and being at least partially filled with small die to thereby minimize any empty space between the die due to their different sizes; and

selected subsets of the main and auxiliary bonding pads being aligned with the die's edges and connected to terminals on the die such that no two pads of the same pair are included in said subset.

4,467,401

ARRANGEMENT FOR THE CONNECTION OF AN ELECTRODE TO A SUPPORT

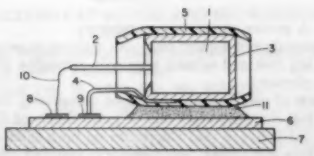
Rainer Siebert, Rothenbach, and Erich Bock, Nuremberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,000

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226222

Int. Cl.³ H05K *7/12*; H01G *1/14*

U.S. Cl. 361—427 **6 Claims**



1. In an arrangement for the mechanical fastening and electrical connection of a pellet which is covered with a surface-

adherent electrode, in particular a tantalum pellet, with a support; the improvement comprising, an intermediate sheathing being positioned between the electrode and the support, said sheathing encompassing the pellet which is covered with the electrode in a non-adherent, form-fitted manner, said intermediate sheathing being glued to said support; and a flexible conductor element electrically connecting said electrode with said support.

4,467,402

VEHICLE LOCK ILLUMINATING SYSTEM

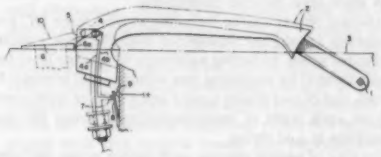
Karlheinz Bauer, Böblingen; Andreas Langenbeck, Sindelfingen; Peter Pfeiffer, Böblingen, and Johann Tomforde, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 259,904

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017096

Int. Cl.³ F21V 7/04

U.S. Cl. 362—32 19 Claims



1. An illuminating system, for illuminating a door lock of a motor vehicle, associated with a door handle of a motor vehicle door that is mounted on the motor vehicle door so as to be pivotable outwardly therefrom between a normal position and an operative position spaced outwardly from said normal position, comprising, light emitting means arranged in the door handle for emitting beams of light on the door lock, the light emitting means disposed in the door handle and exposed only when the door handle is pivoted outwardly to the operative position, and electrical contact means associated with an electric circuit for controlling the light emitting means connected to the light emitting means and the door handle in a manner wherein upon pulling of the door handle to the operative position the electric circuit of the illuminating system is completed and the light emitting means illuminates the door lock.

4,467,403

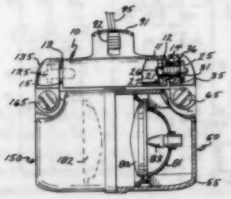
TWIN BEAM PORTABLE LIGHT ASSEMBLY

Richard L. May, Manhattan Beach, Calif., assignor to Allen Group, Inc., Compton, Calif.

Filed Apr. 11, 1983, Ser. No. 483,893

Int. Cl.³ F21V 21/32

U.S. Cl. 362—250 4 Claims



1. A portable lighting assembly conformed for electrical excitation and pivoted to collapse for storage, comprising:

a substantially rectangular center section including a first and second lateral edge surface each provided with an opposed pivot mount proximate the center thereof;

a first and second swivel block arranged for pivotal engagement to the respective ones of said pivot mounts in said first and second edge surfaces each said swivel block being of an elongate conformation substantially equal to the corresponding ones of said first and second lateral edges;

pivotal engaging means deployed to engage said first and second swivel block to the corresponding ones of said pivot mounts in said first and second lateral edge surfaces, said engaging means including manually securing operable means for selectively fixing the pivotal motion of said first and second edge surfaces;

a first and second light assembly of substantially rectangular shape hinged along one edge thereof from the corresponding ones of said first and second swivel blocks for articulation from a first position adjacent said center section to a second position distal thereof; and

manually operable fixing means deployed between said first and second light source and the corresponding ones of said first and second swivel blocks for selective fixing of the relative hinging articulation thereof.

4,467,404

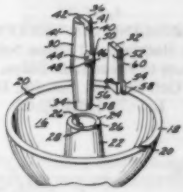
REFLECTOR FOR SPOKED WHEEL

Jack J. Gordon, 2925 Pemba Dr., Costa Mesa, Calif. 92626

Filed Nov. 30, 1981, Ser. No. 326,018

Int. Cl.³ F21V 7/00

U.S. Cl. 362—346 25 Claims



1. A reflector for attachment to a spoke of a spoked wheel, comprising;

first and second mating reflective elements defining a continuous reflective surface,

a bearing member for each of said elements extending therefrom, and spoke-retention means associated with said bearing means for securely attaching said elements to each other and to sad spoke, said spoke-retention means comprising a pin held in said bearing members and containing access means therein to allow a spoke to be seated therein.

4,467,405

SPRING CLIP BRACKET

Franz K. Weber, Canoga Park, Calif., assignor to Modulite Corporation, Canoga Park, Calif.

Filed Apr. 4, 1983, Ser. No. 481,627

Int. Cl.³ F21V 1/06

U.S. Cl. 362—352 4 Claims

1. A light fixture for assembly without use of tools other than the hands of the assembler, comprising:

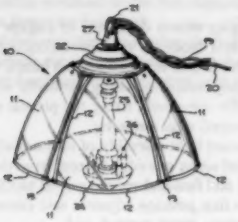
a panel supporting structure;

a plurality of arcuate elongated lamp shade panels each having top, bottom, right-hand and left-hand portions and each being attachable by its top portion about said panel supporting structure so as to form a continuous contiguous array of said panels;

a plastic molding around the periphery of each of said arcuate elongated lamp shade panels so as to form a complete plastic casing about the edges thereof;

a plurality of retaining spring clip brackets releasably attach-

able to said lamp shade panels at the bottom portions thereof upon said plastic casings so as to secure by friction, contiguous right-hand and left-hand portions of adjacent panels.

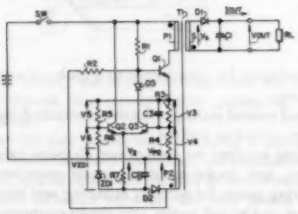


4,467,406

RINGING CONVERTER

Masayuki Hattori, Hachioji, and Shigeo Nakamura, Hino, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,613
Int. Cl.³ H02P *13/20*
U.S. Cl. 363—19 **6 Claims**



1. A ringing converter operatively connected to receive a power source voltage, and operatively connectable to a load having a load current and voltage, comprising:

a transformer having first and second primary windings and a secondary winding;

switching means, operatively connected between said first and second primary windings to receive said power source voltage to said first and second primary windings;

detecting means, operatively connected to said switching means and to said second primary winding, for detecting the current in the primary windings and for providing a control signal responsive to the current in said primary windings;

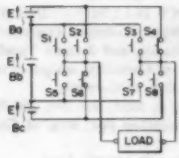
stabilizing means including a differential amplifier means being operatively connected to said switching means, to said second primary winding and to said detecting means, said stabilizing means compensating for resistance in the secondary winding and amplifying said control signal and controlling said switching means in accordance with said amplified control signal such that the load current and voltage is stabilized via said switching means in accordance with said control signal.

4,467,407

MULTI-LEVEL INVERTER

Katsuhiro Asano, Toyoake, and Norio Iwama, Ama, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Nov. 16, 1982, Ser. No. 442,153
Claims priority, application Japan, Dec. 25, 1981, 56-215259
Int. Cl.³ H02M *1/14*
U.S. Cl. 363—43 **13 Claims**



1. A multi-level inverter comprising:

an electric power source including at least three DC power supplies serially interconnected with the same polarities;

a terminal group including a plurality of voltage level terminals formed by providing one voltage level terminal from each end of said power source and a voltage level terminal from each point of interconnection between the power supplies in said series;

a plurality of switch groups, each switch group including a plurality of on/off switches having input terminals and output terminals, each input terminal in a switch group being coupled to a different one of said voltage level terminals, and the output terminals of each switch group being coupled to one another to form a common output terminal for that switch group; and

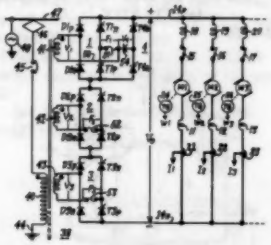
a load having load terminals, each load terminal being connected to the common output terminal of a different switch group.

4,467,408

MEANS FOR CONTROLLING A FORCED COMMUTATED AC-TO-DC ELECTRIC RECTIFYING CIRCUIT TO AVOID COMMUTATION FAILURE

Edward S. Matulevich; Herbert J. Brown, and Ajith K. N. Kumar, all of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 29, 1982, Ser. No. 454,207
Int. Cl.³ H02P *13/00*
U.S. Cl. 363—54 **2 Claims**



1. Improved means for controlling an electric power converter used to supply direct current to an electric load circuit, said converter comprising the combination of

an electric rectifying circuit having a-c input terminals, a pair of d-c output terminals, means including at least one pair of alternately conducting controllable electric valves

for interconnecting said input and output terminals so as to convert alternating voltage at said input terminals to direct voltage of variable average magnitude at said output terminals, and a cyclically operative forced commutation subcircuit including at least one pair of auxiliary controlled rectifiers respectively connected, in circuit with a commutating capacitor, across said controllable valves, whereby each of said valves in turn is forced to turn off upon turn on of a complementary one of said auxiliary rectifiers,

means for applying alternating voltage from an a-c power source to the input terminals of said rectifying circuit,

means for connecting the output terminals of said rectifying circuit to said load circuit,

means for providing a voltage feedback signal representative of the voltage across said commutating capacitor,

means for providing a current feedback signal representative of the instantaneous magnitude of direct current supplied to said load circuit, and

control means for generating a set of firing signals to periodically turn on said controllable valves in synchronism with said alternating voltage at an ignition angle that can be advanced or retarded as desired and for normally producing periodic trigger signals for turning on said auxiliary rectifiers whereby said valves are cyclically turned off in synchronism with said alternating voltage at a desired extinction angle which varies within predetermined limits,

wherein the improvement comprises protective means associated with said control means and responsive to said feedback signals for inhibiting the production of said trigger signals when the magnitude of said capacitor voltage is lower than a critical level which is determined by the magnitude of said current.

4,467,409

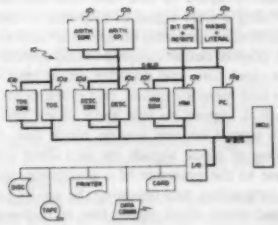
FLEXIBLE COMPUTER ARCHITECTURE USING ARRAYS OF STANDARDIZED MICROPROCESSORS CUSTOMIZED FOR PIPELINE AND PARALLEL OPERATIONS

Hanan Potash, La Jolla; Burton L. Levin, and Melvyn E. Genter, both of San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 5, 1980, Ser. No. 175,430

Int. Cl.³ G06F *9/28, 15/16*

U.S. Cl. 364—200 **10 Claims**



1. A digital computer for performing a set of instructions, said digital computer being comprised of:

an array of microprocessors;

each of said microprocessors being characterized as including respective control memory means for storing commands, means for sequentially fetching selectable sequences of said commands, and circuits that perform functions on digital data in response to said fetched commands;

said circuits being characterized as including a plurality of electrical contacts which define said functions that said circuits perform;

said commands and said contacts being chosen differently within the microprocessors such that the microprocessors are adapted to efficiently perform respective parts of the instructions in said set; and

one of said microprocessors having its circuits and command sequences adapted to perform conditional operations without first determining if those conditions exist; and another of said microprocessors having its circuits and command sequences adapted to determine whether said conditions exist and alert said one microprocessor if they do not exist.

4,467,410

MULTI-PHASE SUBROUTINE CONTROL CIRCUITRY

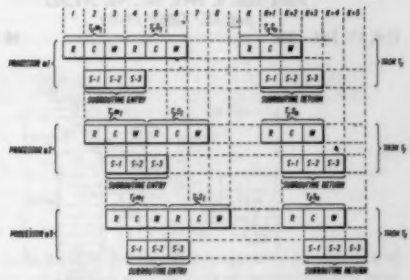
Dongsung R. Kim, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 4, 1981, Ser. No. 231,554

The portion of the term of this patent subsequent to Feb. 7, 2001, has been disclaimed.

Int. Cl.³ G06F *9/38, 9/42*

U.S. Cl. 364—200 **5 Claims**



3. In a cyclically operating data processing system which provides for the concurrent performance of a plurality of tasks wherein a task may include one or more subroutines, subroutine control means comprising:

a return address storage means, one for each task, for storing return addresses for the respective task during performance thereof; and

return address control means responsive to a subroutine entry indication and a task identification indication provided by said system when a task enters a subroutine for determining a return address for the indicated subroutine and for storing said return address in the return address storage means of the respective task;

said return address control means also being responsive to a subroutine entry return indication and a task identification indication provided by said system when a task arrives at the end of a routine for causing a particular return address stored in the respective storage means of the identified task to be accessed therefrom and applied to said system;

said return address control means operating during a cycle to permit a return address to be determined for a first task concurrently with the storing of a return address for a second task in its respective return address storage means, and also concurrently with the accessing of a return address for a third task from its respective return address storage means for transfer to said system;

said return address storage means including a first storage means for each task for storing a plurality of return addresses for its respective task and a second significantly faster storage means for each task for storing the most recent address of its respective task;

said return address control means operating during a cycle in response to said subroutine entry and task identification indications for causing the determined return address to be stored in both of the respective first and second storage means of the identified task;

said return address control means operating during a cycle in response to said subroutine return and task identification indications to access the most recent return address from the second storage means of the identified task for transfer to said system;

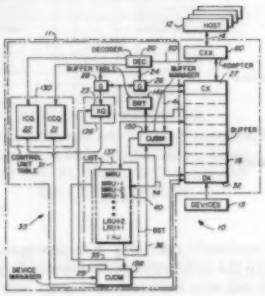
said return address control means also operating during said cycle in response to said subroutine return and task identification indications for causing the next most recent return address to be accessed from the respective first storage means of the identified task and to be stored in the second storage means of the identified task.

4,467,411

SCHEDULING DEVICE OPERATIONS IN A BUFFERED PERIPHERAL SUBSYSTEM

Scott M. Fry; Harry O. Hempy; Charles R. Kirkpatrick, all of Tucson, Ariz., and Bruce E. Kittinger, Fort Collins, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,322
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **16 Claims**



1. The machine-implemented method of operating a storage subsystem having a data buffer with a plurality of buffer data storage spaces and being connected to and shared by a plurality of data storage devices, such buffer data storage spaces being selectively allocatable to said devices;

the method including the automatic machine-implemented steps of:

allocating certain ones of said buffer data storage spaces to respective predetermined ones of said data storage devices for effecting data transfers between said certain ones of said data storage spaces of said buffer and said respective predetermined ones of said devices;

accessing said buffer independently of said devices, maintaining a single list of all said certain ones of said buffer storage spaces based upon said independent accesses from a most recent access through more recent accesses and less recent accesses to a least recent access;

transferring data between respective ones of said allocated certain ones of said buffer data storage spaces and said predetermined ones of said data storage devices in a predetermined sequence of data transfers beginning with said most recent, then said more recent, said less recent and finally said least recent accessed ones of said allocated buffer data storage spaces identified in said maintained list; and

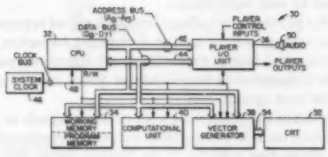
reallocating said buffer data storage spaces between said predetermined ones of said data storage devices to other ones of said data storage devices beginning with said least recently used and continuing with said less recently used ones of said buffer storage spaces.

4,467,412

SLAVE PROCESSOR WITH CLOCK CONTROLLED BY INTERNAL ROM & MASTER PROCESSOR

Morgan P. Hoff, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed May 18, 1981, Ser. No. 264,261
Int. Cl.[3] G06F *15/347, 15/44, 9/28*
U.S. Cl. 364—200 **1 Claim**



1. In a system containing a host processor with a host address bus, a host data bus, and a system clock line, a slave processor and slave address bus comprising:

memory means for storing microinstructions and providing stored microinstructions on a memory output bus in response to addresses presented on said slave address bus, said memory means being a read only memory;

an arithmetic logic unit coupled to at least a portion of said memory output bus, said arithmetic logic unit being adapted to perform arithmetic and logic operations in response to microinstructions provided by said memory means on said memory output bus, said arithmetic logic unit also being coupled to a slave clock line for receiving clock signals;

a sequencer coupled to said slave address bus, said sequencer providing addresses on said slave address bus;

a decoder coupled to said host address bus, said decoder providing a start signal in response to the presence of a predetermined address on said host address bus;

a clock control circuit coupled to said system clock line, said slave clock line, said decoder and at least one output line from said memory means, said clock control circuit sending clock signals on said slave clock line in response to clock signals on said system clock line, terminating the sending of clock signals on said slave clock line in response to the presence of a predetermined condition on said output line, and resuming the sending of clock signals on said slave clock signal line in response to said start signal;

a mapping ROM coupled to said host address bus, said mapping ROM providing an address on a mapping ROM output bus in response to addresses on said host address bus;

a multiplexer coupled to said mapping ROM output bus, said multiplexer providing an output on a multiplexer output bus in response to data on said mapping ROM output bus; and

a load control circuit coupled to said sequencer and said start signal output line, said load control circuit causing the loading by the sequencer of the data on said multiplexer output bus in response to a start signal on said start signal output line.

4,467,413
MICROPROCESSOR APPARATUS FOR DATA EXCHANGE

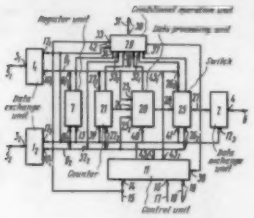
Valery L. Dshkhunian, 103482, korpus 338-a, kv. 73; Sergei S. Kovalenko, 103498, korpus 421, kv. 3; Pavel R. Mashevich, 103482, korpus 338-a, kv. 139; Vyacheslav V. Telenkov, 103527, korpus 811, kv. 75, and Jury E. Chicherin, 103460, korpus 161, kv. 31, all of Moscow, U.S.S.R.

PCT No. PCT/SU79/00117, § 371 Date Jun. 8, 1981, § 102(e) Date Jun. 8, 1981, PCT Pub. No. WO81/01622, PCT Pub. Date Jun. 11, 1981

PCT Filed Nov. 28, 1979, Ser. No. 270,526

Int. Cl.³ G06F *9/18*

U.S. Cl. 364—200 **5 Claims**



1. Microprocessor apparatus for data exchange, said apparatus having external bidirectional data buses, two groups of data exchange units having first multichannel inputs/outputs coupled to said external bidirectional data buses, control inputs and second multichannel inputs/outputs, internal bidirectional data buses, a register unit having bidirectional inputs/outputs coupled to said internal bidirectional data buses, a control input, and an output, said internal bidirectional data buses connecting the second multichannel inputs/outputs of the data exchange units of a first of said two groups, a microinstruction bus, a triggering line, a clock bus, and a control unit having a multichannel output connected to the control inputs of the data exchange units of said two groups and the control input of said register unit, a multichannel input coupled to said microinstruction bus, a first input coupled to said triggering line, an input/output connected to said clock bus, a second input and multichannel inputs/outputs coupled to said internal bidirectional data buses, said apparatus comprising

a data processing/converting unit for converting any change in information transmitted in said apparatus, said data processing/converting unit having a control input, a multichannel input, a multichannel input group and a multichannel output and an output;

a counter having inputs/outputs coupled, together with the multichannel input group of said data processing/converting unit, to said internal bidirectional data buses, respectively, a multichannel output coupled to the multichannel input of said data processing/converting unit, a control input, and an output;

a switch for changing the direction of data flow, said switch having a first group of multichannel inputs/outputs coupled to said bidirectional data buses, a second group of multichannel inputs/outputs coupled to the second multichannel inputs/outputs of the data exchange units of a second of said two groups, a multichannel input coupled to the multichannel output of said data processing/converting unit, a control input, and an output; and

a conditional operation unit for generating processed information tags, said conditional operation unit having an input/output coupled to an external line, multichannel inputs/outputs coupled to said bidirectional data buses, a control input, a multichannel input connected to said microinstruction bus, inputs connected respectively to the output of said register unit, the output of said counter, the output of said data processing/converting unit and the output of said switch, and an output coupled to the second input of said control unit, the multichannel output of said control unit being connected to the control inputs of said counter, said data processing/converting unit, said switch and said conditional operation unit, respectively.

4,467,414
CASHE MEMORY ARRANGEMENT COMPRISING A CASHE BUFFER IN COMBINATION WITH A PAIR OF CACHE MEMORIES

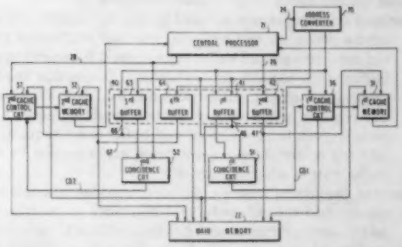
Mikiya Akagi; Hiroyuki Nishimura, and Hideki Nishimura, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,121

Claims priority, application Japan, Aug. 22, 1980, 55-115533; Aug. 28, 1980, 55-118627; Aug. 14, 1981, 56-126579; Aug. 14, 1981, 56-126581

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **6 Claims**



1. A cache memory arrangement responsive to a sequence of operands and a sequence of instructions memorized in a main memory for making a central processor process said operands in compliance with said instructions in a pipeline fashion to produce storage requests and operand readout requests and instruction readout requests, said storage requests being accompanied by storage data and store address data, said operand and said instruction readout requests being accompanied by operand readout address data and instruction readout address data, respectively, said arrangement comprising:

a first cache memory coupled to said central processor and preliminarily loaded with a plurality of blocks of said operands;

a first cache control circuit responsive to said operand readout requests and the accompanying operand readout address data for controlling said first cache memory;

a second cache memory coupled to said central processor and preliminarily loaded with a plurality of blocks of said instructions;

a second cache control circuit responsive to said instruction readout requests and the accompanying instruction readout address data for controlling said second cache memory;

wherein the improvement comprises:

cache buffer means having a plurality of addressable entries and coupled to said central processor and responsive to said storage requests for individually memorizing the accompanying storage data and store address data to produce the memorized storage data and store address data in pairs as buffer output data and buffer output address data, respectively, together with a buffer store request;

first means for supplying said buffer store request and said buffer output address data to said main memory and said first and said second cache control circuits; and

second means for supplying said buffer output data to said main memory and said first and said second cache memories;

said first cache control circuit comprising:

first selecting means coupled to said first means and said central processor and responsive to said operand readout

requests and said buffer store request for selecting said buffer store request only when said operand readout requests are absent and for selecting said operand readout requests when said operand readout requests are present even in presence of said buffer store request, the selected buffer store request being accompanied by said buffer output address data; and

first producing means coupled to said first selecting means, said first cache and said main memories, and said central processor and supplied with said operand readout address data and said buffer output address data for producing said operand readout address data and said buffer output address data when said operand readout requests and said buffer store request are selected by said first selecting means, respectively, said first cache memory storing the buffer output data supplied through said second means in addresses specified by the produced buffer output address data, the produced operand readout address data being transferred to said first cache memory;

said second cache control circuit comprising:

second selecting means coupled to said first means and said centra processor and responsive to said instruction readout requests and said buffer store request for selecting said buffer store request only when said instruction readout requests are absent and for selecting said instruction readout requests when said instruction readout requests are present even in presence of said buffer store request, the selected buffer store request being accompanied by said buffer output address data; and

second producing means coupled to said second selecting means, said second cache and said main memories, and said central processor and supplied with said instruction readout address data and said buffer output address data for producing said instruction readout address data and said buffer output address data when said instruction readout requests and said buffer store request are selected by said second selecting means, respectively, said second cache memory storing the buffer output data supplied through said second means in addresses specified by the produced buffer output address data, the produced instruction readout address data being transferred to said second cache memory.

4,467,415

HIGH-SPEED MICROPROGRAM CONTROL APPARATUS WITH DECREASED CONTROL STORAGE REQUIREMENTS

Hiroshi Ogawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,211
Claims priority, application Japan, Sep. 4, 1980, 55-122724
Int. Cl.³ G06F 9/36
U.S. Cl. 364—200 **6 Claims**

1. A microprogrammed control apparatus for controlling microinstruction sequences, each microinstruction having a branch address field, comprising:

first control store means (**140**) for storing control information and for providing said control information as an output in response to a first address;

first address means (**120**) for providing said first address to said first control store means;

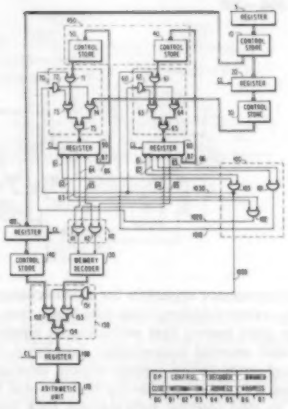
second control store means (**30**) for storing at least a first microinstruction and for providing said first microinstruction as an output in response to a second address;

second address means (**20**) for providing a said second address to said second control store means;

third control store means (**450**) composed of at least first and second control store portions (**40, 50**), each of which stores a plurality of microinstructions, said first control store portion providing a selected one of its plurality of microinstructions at its output in response to a third address and said second control store portion providing a respective one of its plurality of microinstructions at its output in response to a fourth address;

third address means (**80, 90**) for providing said third and fourth addresses to said first and second control store portions in response to the branch address field (**B6, B7**) of said first microinstruction provided as an output from said second control store means (**30**);

first selecting means (**60, 70, 80, 90, 110**) receiving the outputs from said second and third control store means and responsive to first selection signals for selecting either said first microinstruction or a selected one of said plurality of microinstructions given from said third control store means;



decoding means (**130**) receiving the output of said first selecting means for decoding at least one microinstruction selected by said first selecting means;

second selecting means (**150**) receiving the outputs from said first control store means (**140**) and said decoding means (**130**) and responsive to second selection signals for selecting either the decoded result of the decoding means (**130**) or the control information given from the first control store means (**140**); and

control means for generating said first and second selection signals.

4,467,416

LOGIC TRANSFER AND DECODING SYSTEM

David E. Cushing, Chelmsford; Richard A. Lemay, Carlisle; Philip E. Stanley, Westboro, and William E. Woods, Natick, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 16, 1981, Ser. No. 302,898
Int. Cl.³ G06F 7/00
U.S. Cl. 364—200 **4 Claims**

1. A hardware/firmware logic control subsystem in a data processing system, said data processing system including a central memory subsystem, and a central processing unit (CPU) having a firmware control subsystem, said firmware control subsystem being in electrical communication with said logic control subsystem by way of a local communication bus, said logic control subsystem which comprises:

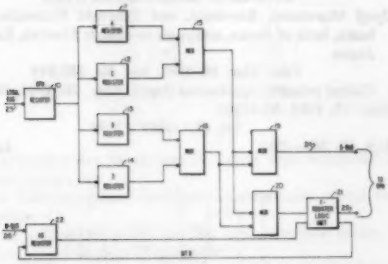
(a) first register means responsive to a plurality of signals from said firmware control subsystem for receiving from said central memory subsystem binary information including CPU instruction words and procedure words;

(b) plural register means including a plurality of registers in electrical communication with said first register means, said plurality of registers being responsive to a plurality of clock signals for storing single words received during one cycle of operation and double words received during

another cycle of operation from said first register means, said plurality of registers being responsive to a plurality of output-enable signals for reading out selected ones of said plurality of registers by said CPU;

(c) multiplexer means in electrical communication with said CPU and responsive to said plurality of signals from said firmware control subsystem and to selection control signals for receiving said binary information representative of said procedure words from selected ones of said plurality of registers for transfer to said CPU;

(d) logic selection control means responsive to said plurality of signals from said firmware control subsystem for issuing at the beginning of an access of said plurality of registers by said CPU information requests to said central memory subsystem, said output-enable signals, said selection control signals to said multiplexer means, and said plurality of clock signals for loading said selected ones of said plurality of registers with said binary information



from said first register means while accommodating the selectable accessing of remaining ones of said plurality of registers by said multiplexer means; and

(e) instruction decoding means in electrical communication with said multiplexer means and said CPU, and responsive to said plurality of signals from said firmware control subsystem for storing said CPU instruction words received from said plurality of registers, said CPU instruction words including a first field and a second field and accommodating the modification of said CPU instruction words during instruction execution by substituting computed binary codes received from said CPU for said first field, while providing a continued access to said second field of said CPU instruction words by said firmware control subsystem without compromising the information transfer rate from said plurality of registers through said multiplexer means and said instruction decoding means to said CPU.

4,467,417

FLEXIBLE LOGIC TRANSFER AND INSTRUCTION DECODING SYSTEM

William E. Woods, Natick; David E. Cushing, Chelmsford; Richard A. Lemay, Carlisle, and Philip E. Stanley, Westboro, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

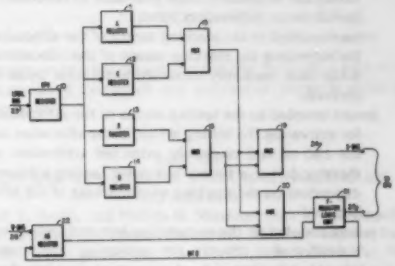
Filed Sep. 16, 1981, Ser. No. 302,903
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. A hardware/firmware logic control system in a data processing system including a central memory system and a central processing unit (CPU), said logic control system comprising:

(a) cache memory means coupled to said central memory system for requesting and receiving information from said central memory system;

(b) register means coupled to said cache memory for receiving from said cache memory said binary information including instruction words and procedural words from either said cache memory means or from said central memory system through said cache memory means;

(c) logic selection control means having first means responsive to a first plurality of signals from said CPU for requesting a first information word from said cache memory means, said logic selection control means further having second means responsive to a second plurality of signals from said CPU for storing said first information word in said register means and reading out a second information word previously stored in said register means by said cache memory means in response to a previous request by



said first means for transfer to said CPU if said second plurality of signals indicates that said second information word is representative of a procedural word; and

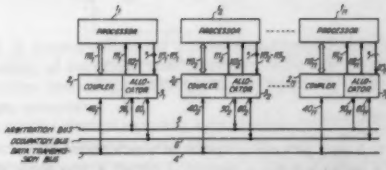
(d) instruction decoding means coupled to said register means and said logic selection control means for storing said second information word in response to said second plurality of signals if said second plurality of signals indicates an instruction word, said instruction decoding means further having means for modifying said instruction word during the execution by said CPU of an instruction specified by said instruction word.

4,467,418

DATA TRANSMISSION SYSTEM RESOLVING ACCESS CONFLICTS BETWEEN TRANSMITTERS-RECEIVERS TO A COMMON BUS

Jean-Paul Quinquis, rue de Cornic, Perros-Guirec, France (22700)

Filed Sep. 14, 1981, Ser. No. 301,837
Claims priority, application France, Sep. 12, 1980, 80 19751
Int. Cl.³ G06F *15/16, 15/40*
U.S. Cl. 364—200 **4 Claims**



1. A data transmission and access conflict settling system including a plurality of asynchronous and unranked data transmitters-receivers divided into a requestor category and a server category, the transmitters-receivers of the server category implementing services requested by the transmitters-receivers of the requestor category, the said transmitters-receivers being interconnected by (1) a data transmission bus, (2) an occupation bus having a state dependent upon the availability or unavailability of the data transmission bus and (3) an arbitration bus, said data transmission system comprising, in each transmitter-receiver:

an allocation circuit associated with the transmitter-receiver and selectively connecting the transmitter-receiver to the arbitration bus, said allocation circuit having means for marking said arbitration bus and means for testing said arbitration bus;

an arbitration pulse generator for deriving arbitration pulses having randomly distributed durations, the durations of the arbitration pulses generated by the arbitration pulse generator in the different transmitters-receivers being different;

means controlled by a transmitter-receiver requesting service, coupled to the arbitration pulse generator, for activating the arbitration pulse generator to randomly extract therefrom an arbitration pulse;

means coupled to the marking means of the allocation cicuit for activating the marking means of the allocation circuit while said randomly extracted arbitration pulse is being derived;

means coupled to the testing means of the allocation circuit for activating the testing means of the allocation circuit at the end of said randomly extracted arbitration pulse to thereby derive a binary test pulse having a binary value dependent on the marking or unmarking of the arbitration bus; and

means coupled to the occupation bus and testing means of the allocation circuit for activating the transmitter-receiver to capture the data transmission bus depending on the state of the occupation bus and the binary value of the test pulse.

4,467,419

DATA PROCESSING SYSTEM WITH ACCESS TO A BUFFER STORE DURING DATA BLOCK TRANSFERS

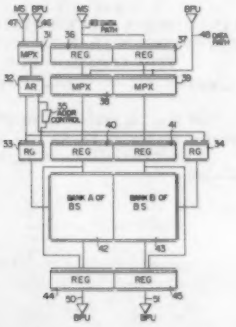
Katsuro Wakai, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,895

Claims priority, application Japan, Dec. 23, 1980, 55-182543

Int. Cl.³ G06F *13/06*

U.S. Cl. 364—200 **7 Claims**



1. A data processing system in which access by a processor to a buffer storage is permitted during a data block transfer from a main storage to the buffer storage, comprising:

a main storage for storing data sectioned into blocks each including a plurality of data bytes;

a buffer storage for storing a copy of one of the blocks of said main storage as a unit; and

control means for controlling read and write operations of said main storage and said buffer storage in response to a received access request;

said main storage including means for transferring a block of data to said control means in sub-units of said unit during a plurality of successive transfer times, each sub-unit of data being transferred together with a first access request to write the data in said buffer storage during a respective one of said successive transfer times;

processor means for issuing a second access request to said control means to read or write data from or into said buffer storage;

said control means including accepting means for accepting receipt of said second access request from said processor means between first access requests sequentially received from said main storage so as to permit a buffer storage access by said processor means during a data block transfer from said main storage.

4,467,420

ONE-CHIP MICROCOMPUTER

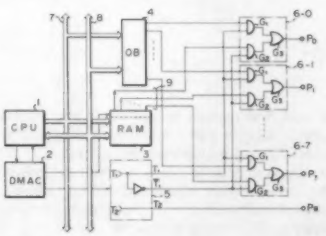
Jyoji Murakami, Kawasaki, and Tsuyoshi Watanabe, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1982, Ser. No. 359,818

Claims priority, application Japan, Mar. 20, 1981, 56-40801; Mar. 25, 1981, 56-43503

Int. Cl.³ G06F *13/06*

U.S. Cl. 364—200 **12 Claims**



1. A one-chip microcomputer having a direct memory access and central processing unit operation mode, comprising:

a central processing unit having arithmetic, logic and control units, for setting the direct memory access operation mode or central processing unit operation mode and for processing first and second data;

a random-access memory, operatively connected to said central processing unit, for storing the second data in a predetermined area and instructions processed by said central processing unit;

an output buffer register, operatively connected to said central processing unit, for storing the first data processed by said central processing unit;

a direct memory access controller, operatively connected to and controlled by said central processing unit, for reading out the second data from the predetermined area of said random-access memory;

port means, operatively connected to said output buffer and said random access memory, for receiving the first data from said output buffer register and the second data, from said random-access memory;

terminals operatively connected to said port means and used for the central processing unit operation mode and the direct memory access operation mode; and

time-division means, operatively connected to said direct memory access controller and said port means and controlled by said direct memory access controller, for transmitting the first and second data through said port means to said terminals.

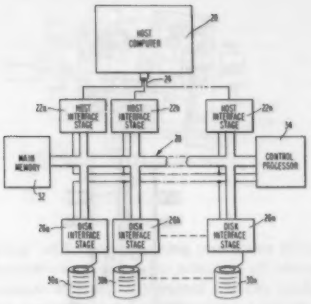
4,467,421
VIRTUAL STORAGE SYSTEM AND METHOD

Barry B. White, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Continuation-in-part of Ser. No. 261,950, May 8, 1981, , and Ser. No. 85,909, Oct. 18, 1979,. This application Jun. 2, 1982, Ser. No. 384,381

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **30 Claims**



1. Apparatus for the storage of digital data organized into records comprising:

host interface means for receiving data from a host computer;

cache means connected to said host interface means for temporary storage of said data;

storage device interface means for connecting said cache means to one or more memory storage devices of one or more classes of storage devices for comparatively long-term storage of said data; and

controller means including address recall means, for:

(a) determining where said data is to be stored on said storage devices;

(b) controlling flow of said data from said host interface means through said cache means and said storage device interface means onto said storage devices; and

(c) storing the addresses at which said data has been stored on said storage devices;

whereby a given user-defined data set may be stored on a plurality of storage devices, selected from one or more classes of storage devices by said controller means.

4,467,422
ARRAY PROCESSOR

David J. Hunt, Stotfold, England, assignor to International Computers Limited, London, England

Continuation of Ser. No. 240,896, Mar. 15, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 508,175

Claims priority, application United Kingdom, Mar. 28, 1980, 8010574

Int. Cl.³ G06F *15/16, 7/48*

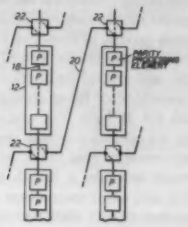
U.S. Cl. 364—200 **5 Claims**

1. A data processing system comprising

(i) a plurality of processing elements logically arranged in rows and columns, each column being divided into a plurality of groups of n elements (where n is an integer greater than one),

(ii) a plurality of data paths connecting together serially the elements within each group, and

(iii) switching means connected to the northernmost element in each group, the switching means being operable in a first state to connect said northernmost element to the southernmost element of the adjacent group in the same column in the northern direction thereby permitting data to be transferred northwards and southwards between processing elements in the same column, and the switching means being operable in a second state to connect said northernmost element to the southernmost element of a



group in an adjacent column thereby permitting data to be transferred eastwards and westwards between different columns.

4,467,423
METHOD AND SYSTEM FOR CONTROLLING AN APPARATUS

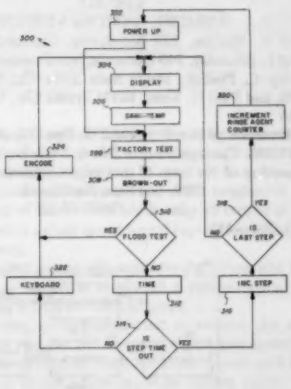
Robert L. Smith, and Melvin B. Mozingo, both of Indianapolis, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 118,670, Feb. 5, 1980, Pat. No. 4,305,122. This application Nov. 2, 1981, Ser. No. 317,136

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ G05B *19/04;* G06F *15/46*

U.S. Cl. 364—400 **6 Claims**



1. A control system for a dishwashing apparatus having a plurality of selectable wash functions, with each said wash function including a plurality of predetermined operational steps, comprising:

a control element including a microcomputer for controlling the performance of said dishwashing apparatus;

means for inputting selection of one of said wash functions to said control element;

means for interfacing said control element with said dishwashing apparatus for allowing direct control of said operational steps by said control element;

means for displaying wash function selections, operating conditions and operating times of said dishwashing apparatus; and

an instruction program stored in said control element for affecting the operation of said control element, said instruction program having a sequence of instruction means groups for performance by said control element including a first instruction means group for controlling said display

means, a second instruction means group following said first instruction means group for testing for the existence of said operating conditions and for delaying or advancing the progress of said control element through said instruction means groups in response to the tested existence of said operating conditions, a third instruction means group following said second instruction means group for testing for the existence of flood conditions in said dishwashing apparatus for at least four consecutive seconds and for affecting the operation of said apparatus in response to the tested existence of said flood conditions for at least four consecutive seconds, a fourth instruction means group following said third instruction means group for timing the operation of said wash functions and said operational steps for directing the progress of said control element in response to said timing, a fifth instruction means group following said fourth instruction means group for determining input selections to said dishwashing apparatus, and a sixth instruction means group following said fifth instruction means group for enabling said operational steps of said dishwashing apparatus in response to determined input selections from said fifth instruction means group and in response to said third instruction means group and for returning said control element to said first instruction means group thereafter.

4,467,424

REMOTE GAMING SYSTEM

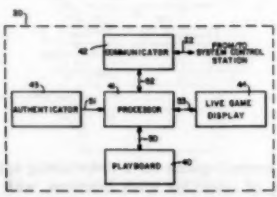
Richard A. Hedges, 130 Montecito, Oakland, Calif. 94610; David L. Shockley, 340 Dorantes, San Francisco, Calif. 94116; Stanley C. Fralick, 21476 Sara Hills Ct., Saratoga, Calif. 95070, and Paul H. Kane, 10471 Scenic Cir., Cupertino, Calif. 95014

Continuation of Ser. No. 104,275, Dec. 17, 1979, Pat. No. 4,339,798. This application Jul. 6, 1982, Ser. No. 395,229

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.³ G06F *15/28*

U.S. Cl. 364—412 **14 Claims**



1. A remote gaming terminal for use in a gaming system enabling a player to participate in a plurality of live games being played at a remote location, comprising:

selection means for selecting one of said plurality of live games;

a live game display responsive to said selection means for displaying a selected game;

playboard means for displaying one of a plurality of playboards, each said playboard having indicia representing wagering possibilities for a corresponding one of said plurality of live games and indicia for displaying the results for said corresponding game when played, said playboard means displaying a playboard corresponding to said selected game in response to said selection means; and

processor means responsive to said selection means for controlling said game display and said playboard means.

4,467,425

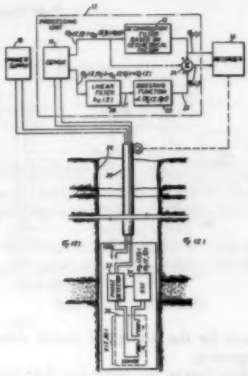
DECONVOLUTION FILTER FOR INDUCTION LOG PROCESSING

Richard T. Schaefer, Houston, Tex., and Clinton H. Dutcher, Jr., Tulsa, Okla., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jan. 12, 1982, Ser. No. 338,951

Int. Cl.³ G01V *3/18, 3/38*

U.S. Cl. 364—422 **21 Claims**



1. A method of processing induction measurements of sub-surface formations taken by an induction logging system at various depths in a borehole in the earth, the logging system having a sonde response function which varies with the conductivity of the sub-surface formations being investigated, the spatial domain sonde response function characterized by a main lobe and side-lobes, said method reducing unwanted contributions in each measurement from formation currents flowing in formations spaced apart from each measurement depth, said method comprising the steps of:

(a) windowing the sonde response function obtained at zero conductivity by truncating its Fourier transform at a frequency less than the frequency at which the transformed function first goes to zero;

(b) selecting a target transfer function containing frequencies within the window;

(c) generating a spatial domain filter response function from the truncated transformed zero conductivity sonde response function and the target transfer function which when convolved with the zero conductivity spatial domain sonde response function results in a system response function having minimum sidelobes; and

(d) convolving the spatial domain filter response function with the log measurements to obtain a processed log in which the unwanted contributions in each measurement from formation currents flowing in formations spaced apart to each measurement depth point are reduced.

4,467,426

AIR LUMBAR SUPPORT

Takashi Hida; Katsuki Takayama, and Kazutaka Kuwana, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 1, 1981, Ser. No. 279,419

Claims priority, application Japan, Jul. 25, 1980, 55-102112

Int. Cl.³ G06F *15/20*; F16M *13/00*

U.S. Cl. 364—424 **9 Claims**

1. An air lumbar support for a vehicle seat comprising:

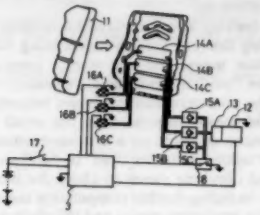
air bag means mounted in the lower portion of a seat back to vary the contour thereof;

air pump means connected to the air bag means for supplying air to the air bag means;

valve means coupled to the air pump means for controlling air flow from the pump means to the air bag means;

solenoid valve means coupled to the air bag means for controlling air pressure in the air bag means; and

an electronic control means comprising electronic processor means, key switch means and memory means storing standard attitude establishing data which indicates the timed energization of the solenoid valve means,



said electronic control means being responsive to standard attitude establishing data upon actuation of selected key switch means by reading standard attitude establishing data and controlling the energization of the air pump means and the timed energization of the solenoid valve means for establishing an air pressure in the air bag means corresponding to the standard attitude establishing data.

4,467,427

METHOD OF PREVENTING ERRONEOUS GEAR SELECTION IN AN AUTOMATIC GEAR SELECTION SYSTEM IN VEHICLES

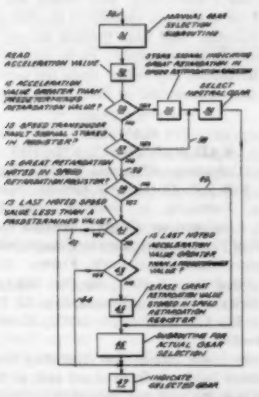
Karl G. Magnusson, Handen, Sweden, assignor to Saab-Scania Aktiebolag, Sweden

Filed Nov. 19, 1981, Ser. No. 322,852

Claims priority, application Sweden, Nov. 28, 1980, 8008400

Int. Cl.³ B60K *20/16*; G05D *17/02*

U.S. Cl. 364—424.1 **3 Claims**


MANUAL GEAR SELECTION SUBROUTINE
READ ACCELERATION VALUE
SELECT INPUT GEAR
IS GREAT RETARDATION NOTED IN SPEED RETARDATION REGISTER?
IS LAST NOTED SPEED VALUE LESS THAN A PREDETERMINED VALUE?
IS LAST NOTED ACCELERATION VALUE GREATER THAN A PREDETERMINED VALUE?
ERASE GREAT RETARDATION VALUE STORED IN SPEED RETARDATION REGISTER
SUBROUTINE FOR ACTUAL GEAR SELECTION
INDICATE SELECTED GEAR

1. A method of preventing an automatic selection of an erroneous gear in a vehicle gearbox which is associated with an automatic gear selection system, the method comprising the steps of:

determining both the instantaneous rotational speed and the instantaneous rotational acceleration value of a vehicle wheel;

comparing said rotational acceleration value with a first predetermined acceleration value representing a deceleration value;

following a neutral gear selection routine if and as long as said rotational acceleration value exceeds said first predetermined acceleration value; and

discontinuing said neutral gear selection routine and following a normal gear selection routine when said rotational speed is equal to or greater than a predetermined speed value and said rotational acceleration value is smaller than a second predetermined rotational acceleration value, which is a deceleration value and which is smaller than said first rotational acceleration value.

4,467,428

AUTOMATIC SPEED CONTROL SYSTEMS

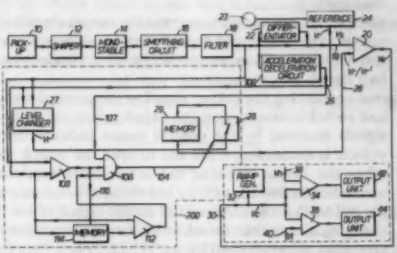
Kenneth B. Caldwell, Rugby, England, assignor to Associated Engineering Limited, Rugby, England

Filed Jul. 21, 1981, Ser. No. 285,533

Claims priority, application United Kingdom, Aug. 8, 1980, 8025882

Int. Cl.³ G05D *13/00*

U.S. Cl. 364—426 **4 Claims**



1. A speed control system for automatically controlling an engine-powered vehicle to run at a desired speed set by the driver of the vehicle, comprising

speed-responsive means connected to be responsive to the actual speed of the vehicle and having an output at which is produced an actual speed signal representing the actual vehicle speed,

driver-controlled means adjustable by the driver and having an output at which is produced a desired speed signal representing a desired vehicle speed,

a level changing circuit connected to receive the desired speed signal and the actual speed signal and operative to measure any difference between those signals and having an output at which is produced an output signal with a value which corresponds to the value of the desired speed signal when the actual vehicle speed does not exceed the desired speed by more than a predetermined amount but otherwise follows the value of the actual vehicle speed so as to represent an increasing vehicle speed as the vehicle descends a hill,

a memory having an input and an output,

switch means connected between the output of the level changing circuit and the input of the memory,

whereby when the switch means is closed the said output signal of the level changing circuit is fed continuously to the input of the memory and appears at the output thereof with a value instantaneously the same as the value at the input thereof, and when the switch means is opened the memory stores the value of the output signal of the level changing circuit at the input when the switch means is opened, this stored value appearing at the output of the memory while the switch means is open,

a first comparator having first and second inputs and an output,

means connecting the output of the memory to the first input of the first comparator,

means connecting said second input of the first comparator to said output of the speed-responsive means to receive said actual speed signal,

whereby the first comparator produces at its output a speed error signal having a sign and magnitude depending on the sign and magnitude of the difference between the speeds represented by the signals at its said first and second inputs,

output means connected to the engine and responsive to the sign and magnitude of the error signal to control the engine whereby to adjust its power in a direction and by an amount to bring the error signal to zero,

a second comparator having first and second inputs respectively connected to receive the desired speed signal and the actual speed signal and an output at which is produced an output signal having a value dependent on the relative values of the desired speed signal and the actual speed signal,

an acceleration-deceleration unit connected to respond to the actual speed of the vehicle and thus to the acceleration and deceleration of the vehicle so as to produce an output signal indicating whether the vehicle is accelerating or decelerating,

control means connected to receive the output signals of the second comparator and the acceleration-deceleration unit and which produces an output signal dependent on the two signals received,

means connecting the output signal of the control means to said switch means to close the switch means when the two signals received by the control means indicate that the vehicle is descending a hill and to open the switch means when the output signal of the acceleration-deceleration unit indicates that the vehicle is starting to decelerate after the hill so that the value of the output signal of the level changing circuit then stored in the memory represents the maximum speed attained by the vehicle before that deceleration,

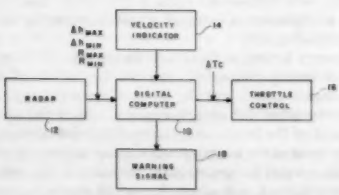
said control means being responsive to the output signal of the second comparator and to the output signal of the acceleration-deceleration unit to close the switch means either when the actual vehicle speed has fallen to a value substantially equal to the desired speed or when the vehicle starts to accelerate.

4,467,429

AIRCRAFT THRUST CONTROL SCHEME FOR TERRAIN FOLLOWING SYSTEM

Warren C. Kendig, Elliott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 13, 1982, Ser. No. 339,204
Int. Cl.³ G05D *1/08;* G06G *7/78*
U.S. Cl. 364—433 **6 Claims**



1. A throttle control system for an aircraft in which thrust is controlled by throttle settings, operating in a terrain following mode using a base throttle setting for a trim value of thrust for a nominal velocity desired for level flight, and having storage means containing predetermined values for maximum and minimum velocity, a predetermined acceleration margin, and given values relating to lift and thrust capabilities of the aircraft, said system comprising:

(a) input means to obtain values of the low and high points based on a search of terrain profile ahead of the aircraft from radar instruments, and means to obtain a value of the current velocity;

(b) prediction means comprising computation means using the values obtained by the input means of the high and low points, and of the current velocity to predict the maximum and minimum velocities over said profile with said trim value of thrust;

(c) first checking means to check for reduced throttle action including first comparison means using values from said prediction means and said storage means to determine whether "yes" the predicted maximum velocity is less than the predetermined maximum velocity or "no" it is not, and means responsive to the result from the first comparison means to set a first intermediate variable to a first or second value for "yes" or "no" respectively;

(d) second checking means to check for increased throttle action, including further computation means using values from the prediction means and the given values from the storage means to calculate a projected acceleration margin at the trajectory high point, and second comparison means to determine whether "yes" the projected acceleration margin is greater than said predetermined acceleration margin at said high point or "no" it is not, and means responsive to the result from the second comparison means to set a second intermediate variable to a first or second value for "yes" or "no" respectively;

(e) output means effective after operation of the first and second checking means for setting a command variable to a first value, a value of a second set, or a value of a third set, using the values of the first and second intermediate variables, the command variable being set to its first value responsive to the first and second intermediate variables both having their first value, the command variable being set to a value of the second set responsive to the first and second intermediate variables having their second and first values respectively, and the command variable being set to a value of the third set responsive to the first and second intermediate variables having their first and second values respectively, and means for supplying the value of the command variable to throttle control apparatus to maintain said base throttle setting, to provide a decreased thrust increment, or to provide an increased thrust increment, depending upon the command variable having the first, second or third value respectively.

4,467,430

RAILWAY TRACK CIRCUIT

André Even, Coignieres; Christian Fortier, Egly; Michel G. Guillard, Villejuif; Dominique Hedoin, Sceaux; Serge A. Le Guen, Verrieres le Buisson, and Dominique D. Raucourt, Longpont sur Orge; Christian H. Vendeventer, Plaisir, all of France, assignors to Compagnie de Signaux et d'Entreprises Electriques, Paris, France

Filed Sep. 15, 1981, Ser. No. 302,101
Claims priority, application France, Sep. 22, 1980, 80 20340
Int. Cl.³ B61L *3/20, 11/02, 21/06*
U.S. Cl. 364—436 **6 Claims**

1. A railway track circuit for separating first and second successive trains having a front shunt axle at the front and a rear shunt axle at the rear and travelling in the same direction on a track comprising a plurality of track circuits, each said track circuit being switchable between an initial state in the absence of a shunt axle on said track circuit and a complementary state upon passage of a front shunt axle out of said track circuit and comprising:

a pair of rail segments, said rail segments having a downstream end, towards which the trains are travelling, and an upstream end, away from which the trains are travelling,

downstream impedance means electrically connecting said

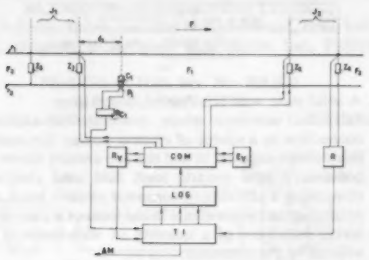
rails at a downstream point and defining the downstream end of said track circuit,

upstream impedance means electrically connecting said rails at an upstream point and defining the upstream end of said track circuit,

a transmitting member electrically connected to said downstream impedance means when said track circuit is in said initial state and to said upstream impedance means when said track circuit is in said complementary state,

a first track circuit receiving member electrically connected to said upstream impedance means when said track circuit is in said initial state and to said downstream impedance means when said track circuit is in said complementary state,

at least one track circuit electromagnetic sensor located



between said upstream and said downstream impedance means in the vicinity of one of said rails for detecting passage of the front and rear shunt axles of the trains over said rails,

a second track circuit receiving member in electromagnetic communication with said at least one track circuit electromagnetic sensor, switchable between energized and de-energized states, and adapted to be switched to said de-energized state upon detection of the passage of the front shunt axle of the first train by said at least one track circuit electromagnetic sensor, and

switching means electrically connected to said transmitting member and said first track circuit receiving member for reversing the electrical connections between said first track circuit receiving member, said transmitting member, and said upstream and downstream impedance means.

4,467,431

APPARATUS AND METHOD FOR CONTROLLING THE SHEARS OF A GLASSWARE FORMING MACHINE

Edward B. Gardner, Bloomfield, and Frederick W. Winzer, East Granby, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 1, 1982, Ser. No. 353,717
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—473 **28 Claims**

7. A control system for controlling the cyclical operation of fluidically driven shears comprising:

means for producing a start signal output at a predetermined first time in each cycle;

means responsive to said start signal for energizing said shears;

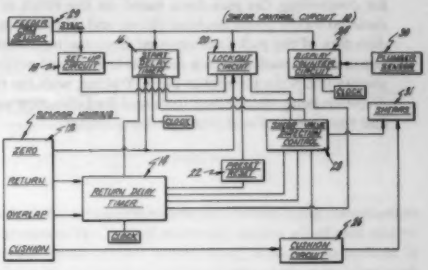
return sensor means for sensing the position of at least one of said shears and for producing a return signal output when said shears are at a first predetermined position in each cycle;

return timer means responsive to said return signal output and operatively connected to said energizing means for producing a return delay signal output at a predetermined second time for reversing said energizing means, said predetermined second time occuring while said shears are moving toward each other.

8. In a control system according to claim 7, a sensor interface for sensing a predetermined position of at least one shear in each cycle and for producing predetermined signal output for said control system, said interface comprising:

at least one sensor vane having an axis;

means secured to said sensor vane and to at least a first one of said shears for translating the oscillatory motion of said first one of said shears to an oscillatory motion of said vane about said axis;



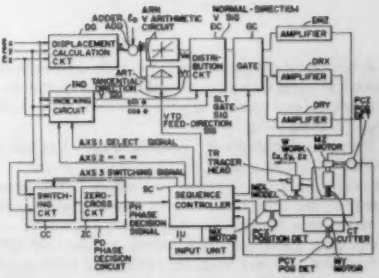
and the return sensor means, said return sensor means comprising means for sensing a first predetermined angular position of said sensor vane and for producing said signal output upon the occurrence of said vane at said first angular position, said first predetermined angular position corresponding to the first predetermined position in each cycle of said first one of said shears.

4,467,432

TRACER CONTROL SYSTEM

Ryoji Imazeki, and Etsuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

PCT No. PCT/JP81/00220, § 371 Date May 10, 1982, § 102(e) Date May 10, 1982, PCT Pub. No. WO82/00966, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 4, 1981, Ser. No. 380,745
Claims priority, application Japan, Sep. 12, 1980, 55-126780
Int. Cl.³ G05B *19/36*; G06F *15/46*
U.S. Cl. 364—474 **2 Claims**



1. A tracer control system in which: a trace direction and a trace velocity are calculated, based on displacement signals from a tracer head tracing a model surface over a trace region; the tracer head performs tracing along a selected feed axis in each of a plurality of selected planes parallel to a selected one of the X-Z and Y-Z planes defined by respective X, Y and Z feed axes of said tracer control system; each time the tracer head has reached a boundary of the trace region, a pick feed is carried out along a respective selected one of said feed axes; and, upon completion of the pick feed, the tracer head proceeds to tracing along the respective selected feed axis in the subsequent one of said planes; said system comprising

an input unit for inputting feed data, including data on the direction of the pick feed along the respective selected feed axis,

a phase decision circuit for deciding the polarity of a respective one of said displacement signals from said tracer head corresponding to the selected feed axis along which said tracing is occurring, and

a sequence controller for producing a feed-direction signal for controlling the pick feed, based on the result of the decision by the phase decision circuit and said data on the direction of the pick feed inputted from the input unit,

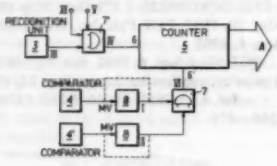
wherein during each said pick feed, the tracer head performs tracing in a plane parallel to the X-Y plane, with the trace direction being determined from said feed-direction signal and the output of said phase decision circuit.

4,467,433

DEVICE FOR DETERMINING A TRIGGER POINT ON AN ELECTRIC SIGNAL WITH GIVEN AMPLITUDE DISTRIBUTION OVER TIME

Peter Claassen, Graz; Heimo Denk, Feldbach, and Werner Moser, Graz, all of Austria, assignors to Hans List, Graz, Austria

Filed Jul. 29, 1981, Ser. No. 288,117
Claims priority, application Austria, Jul. 31, 1980, 3988/80
Int. Cl.[3] G04F *10/00*
U.S. Cl. 364—481 9 Claims



1. A device for determining a characteristic point in time in an electrical signal with a given amplitude distribution vs. time, the electrical signal representing the occurrence of a characteristic event, comprising:

at least one transducer for generating the electrical signal upon the occurrence of the characteristic event;

an evaluation unit responsive to said electrical signal for sensing the occurrence of said characteristic event, and including a number of comparators responsive to said electrical signal and each having respectively different threshold response levels, said threshold levels extending over a specified range of amplitude levels, each said comparator generating a signal pulse upon said electrical signal exceeding the threshold level thereof;

said evaluation unit including a recognition unit having a higher threshold level than each of said comparators and generating a control signal upon said electrical signal exceeding said higher threshold level;

means for counting clock pulses;

means for gating said clock pulses to said means for counting and controlled by said control signal to close said gate and terminate the counting of said clock pulses; and

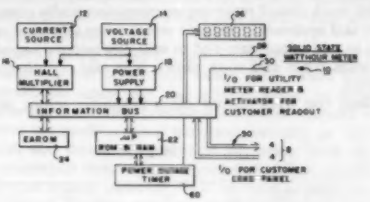
selection circuitry responsive to the individual signal pulses of said comparators to control the resetting and storing operation of said means for counting.

4,467,434

SOLID STATE WATT-HOUR METER

James R. Hurley, Brookfield, and Clyde Gilker, S. Milwaukee, both of, WI, assignors to McGraw-Edison Co., Rolling Meadows, Ill.

Filed Sep. 18, 1981, Ser. No. 303,627
Int. Cl.[3] G01R *21/00*
U.S. Cl. 364—483 4 Claims



1. A solid state watt-hour meter, comprising:

a Hall-Effect watt-hour sensor, connectable to a consumer's connection to a source of electric power, for sensing the line voltage supplied to and the line current drawn by the consumer's total electric load, said total electric load comprising a plurality of consumer electric loads, and for producing an output signal in the form of a train of square waves indicative of a quantity of watt-hours of power utilized by the consumer;

a microprocessor coupled to said watt-hour sensor for receiving said output signal, said microprocessor having at least one load control output which operates a circuit breaker which supplies at least one of said consumer loads, and having at least one switch input which senses the position of a switch;

an electrically alterable ROM operatively coupled to said microprocessor;

power supply means, having an input operatively coupled to the consumer line voltage and an output coupled to said microprocessor, for supplying a regulated DC voltage thereto;

clock signal generating means, operatively coupled between said consumer line voltage and said microprocessor, for supplying a 60 Hz clock signal to said microprocessor;

readout means, operatively coupled to said microprocessor, for providing a readout of the power consumed since the last reading of said solid state watt-hour meter;

power outage timing means, operated in response to said power supply means, for supplying a signal which is characteristic of the duration that said power supply means was inoperative due to a loss of power to said consumer's connection, said power outage timing means including a capacitor which discharges when said power supply means is inoperative and which charges when said power supply means is placed in operation; and

an override switch coupled to said switch input of said microprocessor and said circuit breaker,

said electrically alterable ROM and microprocessor being connected and programmed:

(a) to compute the time of day as determined from an initial time of day setting and said 60 Hz clock signal and to store said time of day in said electrically alterable ROM;

(b) to compute the total power used by the consumer and to store said total power in said electrically alterable ROM;

(c) to provide a readout signal indicative of the total power consumed since the last reading of the meter;

(d) to automatically open said circuit breaker for a time period during the time of day when power demand on said source of electric power is above a first predetermined value and/or the cost per kilowatt hour of said power is above a second predetermined value;

(e) to automatically close said circuit breaker during the time of day when the power demand on said source of electric power is at or below said first predetermined value and/or

the cost per kilowatt hour of said power is at or below said second predetermined value;

(f) to allow the consumer to override said microprocessor control of said circuit breaker by operating said override switch to close said circuit breaker;

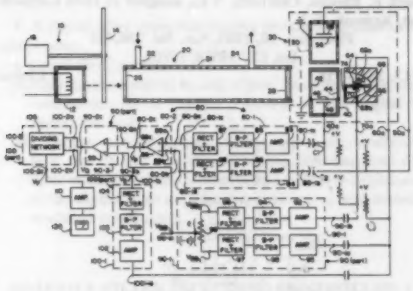
(g) to automatically reset said override switch when said microprocessor functions to automatically close said circuit breaker; and

(h) to correct the value of the time of day stored in said electrically alterable ROM by using the signal from said power outage timing means in the event that said power supply means is temporarily inoperative.

4,467,435
INFRARED GAS ANALYZER HAVING DETECTOR ELEMENTS OF DIFFERING TYPES

Dale F. Warnke, Irvine, and Carl N. Cederstrand, Brea, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 5, 1981, Ser. No. 308,874
Int. Cl.³ G01N *21/26*
U.S. Cl. 364—497 **31 Claims**



1. In an infrared gas analyzer for providing an output signal that is indicative of the concentration of a component of interest of a sample gas, said analyzer being of the type having an infrared source for generating infrared radiation, a sample cell containing the sample gas, and a band pass filter having a pass band that includes predetermined absorption features of the component of interest, the improvemnt comprising:

(a) a first pneumatic detector sensitized to the component of interest,

(b) a black body detector positioned to receive infrared radiation from the source through the sample cell, the band pass filter and the pneumatic detector, and

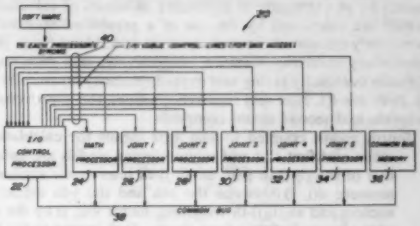
(c) signal processing means for combining the signals produced by the pneumatic and black body detectors to correct said output signal for source and interferent related errors.

4,467,436
ROBOT ARM CONTROLLER WITH COMMON BUS MEMORY

Peter E. Chance, Rosemont, and Mitchell Weiss, Ardmore, both of Pa., assignors to United States Robots, Inc., King of Prussia, Pa.

Filed Oct. 26, 1981, Ser. No. 314,914
Int. Cl.³ G05B *19/42*; G06F *15/46*; B25J *9/00*
U.S. Cl. 364—513 **12 Claims**

1. A robot apparatus comprising a manipulator arm having plural joints and respective motor means associated with said joints to move said manipulator arm to a predetermined spatial position and control means for said arm, said control means comprising respective modular microprocessor based control means for the control of said motors, microprocessor based control means for performing the mathematical computations required to control the trajectories of said arm and common modular microprocessor based coordinating control means for coordinating the activities of said other modular microprocessor based control means, a common electrical bus and accessing means including fixed internal timing means for establishing a predetermined timing cycle for accessing said bus, each

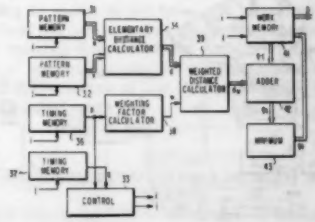


of said microprocessor based control means being connected to said common bus by said accessing means, all of said microprocessor based control means being arranged to operate in parallel with one another, said accessing means providing each of said microprocessor based control means with direct periodic access to said bus during each timing cycle.

4,467,437
PATTERN MATCHING DEVICE WITH A DP TECHNIQUE APPLIED TO FEATURE VECTORS OF TWO INFORMATION COMPRESSED PATTERNS

Shichiro Tsuruta, and Hiroaki Sakoe, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,293
Claims priority, application Japan, Mar. 6, 1981, 56-32060
Int. Cl.³ G10L *1/00*
U.S. Cl. 364—513.5 **29 Claims**



1. In a pattern matching device for calculating an overall similarity measure between a first pattern U represented by a first vector sequence of first through I-th extracted vectors positioned at first through I-th instants, respectively, which are arranged with variable intervals of time as a first timing sequence, and a second pattern V represented by a second vector sequence of first through J-th extracted vectors positioned at first through J-th instants, respectively, which are arranged with variable spacings of time as a second timing sequence, said device comprising first means for generating first and second timing signals indicative of a pair of instants in said first and said second timing sequences at one time, respectively, with the pair varied from a (1, 1)-th pair of the first instants of the respective timing sequences eventually to an (I, J)-th pair of said I-th and said J-th instants through an (i, j)-th pair of the i-th and the j-th instants where i and j are representative of two integers between 1 and I and between 1 and J, respectively, second means responsive to said first and said second timing signals for calculating an (i, j)-th elementary similarity measure for the i-th and the j-th extracted vectors when said first and said second timing signals are indicative of the (i, j)-th pair, and

third means responsive to said first and said second timing signals and to the (i, j)-th elementary similarity measures for iteratively calculating a recurrence formula to successively give a plurality of recurrence values, said recurrence formula given, when said first and said second timing signals are indicative of the (i, j)-th pair, an (i, j)-th one f(i, j) of said recurrence values by an extremum of a plurality of results of calculation which are calculated by the use of a prescribed number of previously calculated recurrence values and at least the (i, j)-th elementary similarity measure, respectively, said recurrence formula eventually giving said overall similarity measure by an (I, J)-th one f(I, J) of said recurrence values, the improvement wherein said second means comprises:

fourth means coupled to said first means for calculating, when said first and said second timing signals are indicative of the (i, j)-th pair, an (i, j)-th intervector similarity measure d(i, j) between the i-th and the j-th extracted vectors and an (i, j)-th weighting factor w(i, j) by the use of the interval of time from the (i − 1)-th instant to the i-th instant; and

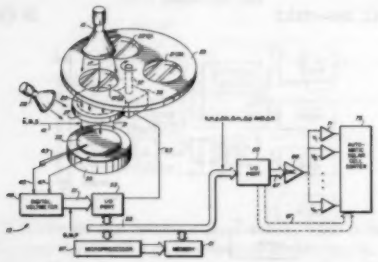
fifth means coupled to said fourth means for calculating, when said fourth means calculates the (i, j)-th intervector similarity measure and the (i, j)-th weighting factor, the (i, j)-th elementary similarity measure.

4,467,438

METHOD AND APPARATUS FOR DETERMINING SPECTRAL RESPONSE AND SPECTRAL RESPONSE MISMATCH BETWEEN PHOTOVOLTAIC DEVICES

Gene A. Zerlaut; Richard D. Whitaker, both of Phoenix, and Arthur W. Purnell, New River, all of Ariz., assignors to DSET Laboratories, Inc., Phoenix, Ariz.

Filed Jan. 18, 1982, Ser. No. 340,038
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—525 **28 Claims**



1. A method for determining the amount of spectral response mismatch between first and second photovoltaic cells, said method comprising the steps of:

(a) storing first, second and third normalized response coefficients corresponding to first, second, and third spectral response distributions of said first photovoltaic cell, the sum of said first, second and third spectral response distributions being equal to a total spectral response distribution of said first photovoltaic cell;

(b) producing light for illumination of said second photovoltaic cell, said light having a predetermined spectral distribution;

(c) sequentially filtering said light by means of a first filter, then by means of a second filter, and then by means of a third filter, to produce first, second, and third spectral distributions, respectively, on said second photovoltaic cell, and thereby causing said second photovoltaic cell to sequentially produce first, second, and third output currents, respectively;

(d) measuring said first, second and third output currents as each of said first, second, and third output currents are sequentially produced and producing first, second, and third digital numbers respectively, representative of the magnitudes of said first, second, and third measured output currents;

(e) computing fourth, fifth, and sixth normalized response coefficients from said first, second and third digital numbers;

(f) computing first, second, and third response differences between said first and fourth normalized response coefficients, between said second and fifth normalized response coefficients, and between said third and sixth normalized response coefficients, respectively;

(g) computing a spectral response mismatch coefficient by computing the square root of the sum of the squares of said first, second, and third response differences; and

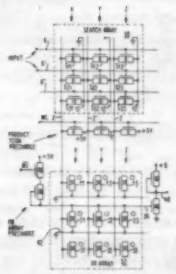
(h) producing a utilization signal representing said spectral response mismatch coefficient.

4,467,439

OR PRODUCT TERM FUNCTION IN THE SEARCH ARRAY OF A PLA

Kenneth E. Rhodes, Charlotte, N.C., assignor to IBM Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,418
Int. Cl.³ H03K *19/08*
U.S. Cl. 364—716 **4 Claims**



1. In a programmed logic array including a search array and an OR array, with the search array including a plurality of FET array devices arranged into rows and columns with the gates thereof in each row selectively connected to a respective row input signal line and with the source/drain paths thereof in each column connected to a respective product term output line, and with the OR array including a plurality of FET array devices arranged into rows and columns, with the gates thereof in each column selectively connected to a respective one of said product term output lines and with a first source/drain path terminal thereof in each row connected to a first polarity reference potential and a second source/drain path terminal thereof in each row connected to a second polarity reference potential and also connected to an output node, the improvement comprising:

a first one of said columns in said search array having the source/drain path of said FET array devices therein connected between a reference potential of said first polarity and a respective one of said product term lines which is precharged to said second polarity, for performing first-type logical functions;

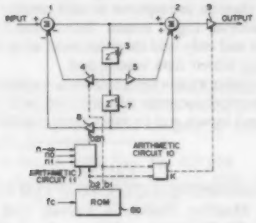
a second one of said columns in said search array having the source/drain path of said FET array devices therein connected between a reference potential of said second polarity and a respective one of said product term lines which is precharged to said first polarity, for performing second-type logical functions.

4,467,440

DIGITAL FILTER APPARATUS WITH RESONANCE CHARACTERISTICS

Shigenori Sano, Tokyo, and Kohtaro Hanzawa, Niiza, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,630
Claims priority, application Japan, Jul. 9, 1980, 55-94461; Jul. 9, 1980, 55-94462; Jul. 9, 1980, 55-94463; Jul. 9, 1980, 55-94466
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 12 Claims



1. A digital filter apparatus having resonance characteristics, comprising:

a digital filter means;

storing means coupled to said digital filter means for storing coefficients for a transfer function of the digital filter apparatus; and

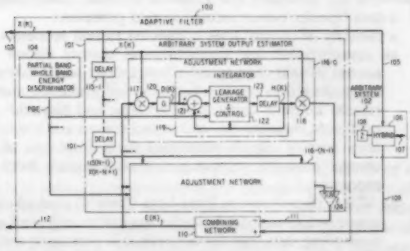
first means coupled to said storing means for modifying at least one of said stored coefficients such that said digital filter means produces a peak in an amplitude characteristic of the digital filter apparatus responsive to said stored and modified coefficients.

4,467,441

ADAPTIVE FILTER INCLUDING CONTROLLED TAP COEFFICIENT LEAKAGE

Charles W. K. Gritton, North Brunswick, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 8, 1982, Ser. No. 433,409
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 10 Claims



1. An adaptive filter including,

means for detecting prescribed filter incoming signal conditions,

a plurality of means each for generating a corresponding one of a plurality of tap coefficient signals, each of said tap coefficient signal generating means including

means for generating a leakage signal having a magnitude,

means for combining the leakage signal with said corresponding one of said tap coefficient signals, and

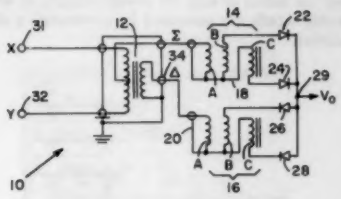
means responsive to a signal from said detecting means for controllably adjusting the leakage signal magnitude during said prescribed filter incoming signal conditions.

4,467,442

MICROWAVE QUARTER-SQUARE MULTIPLIER

Jon Ramer, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 325,695
Int. Cl.³ G06G *7/164*
U.S. Cl. 364—843 3 Claims



1. A microwave quarter-square multiplier comprising: a sum and difference hybrid having first and second inputs for receiving first and second analog input signals, and having first and second outputs for providing sum and difference outputs respectively; a first means responsive to the sum output of said hybrid for providing multiplication and rectification of signals coupled to said first means for providing a direct current output; and a second means responsive to the difference output of said hybrid for providing multiplication and rectification of signals coupled to said second means for providing a direct current output, said direct current outputs being coupled to a common point for providing an output indicative of the multiplication of said first and second analog input signals; and wherein said first and second means are each comprised of three coil windings on a common core, the first winding being disposed to receive input signals from said hybrid, the second and third winding being coupled in series and in opposition for providing an analog output from each of said windings, and each of said first and second means further comprising first and second matched diodes, said first diode being coupled to the output of said second winding and said second diode being coupled to the output of said third winding for providing a direct current output.

4,467,443

BIT ADDRESSABLE VARIABLE LENGTH MEMORY SYSTEM

George T. Shima, Del Mar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 30, 1979, Ser. No. 61,691
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 11 Claims

1. A memory system for reading variable length fields therefrom and for writing variable length fields thereto; each of said fields being addressable by the combination of a word address, a bit address, and a field length; said memory system being comprised of:

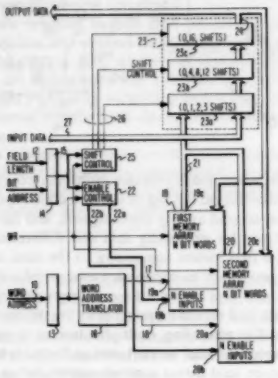
word address translation means for translating said word address into first and second addresses representative of said word address;

a first array of read/write memory cells coupled to receive said first address for addressing a group of N cells therein where N is the maximum length of said field, and a second array of read/write memory cells coupled to receive said second address for also addressing the cells therein in groups of N;

each of said arrays having N enable inputs for receiving respective enable signals that selectively enable the individual cells in an addressed group to be read from and written into, having N data outputs for generating thereon the bits from only said selectively enabled cells, and hav-

ing N data inputs for writing data therefrom into only said selectively enabled cells;

enable control means having 2N enable outputs respectively connected to said enable inputs of said memory arrays for translating said bit address and field length into said enable signals on said enable outputs such that during a read or write operation, the total number of cells that are enabled to be read from and written into equals said field length, and the subset of said 2N enable outputs on which said enable signals are generated is representative of said bit address;



an N bit shifter means coupled to said arrays for shifting output data read from said enabled cells and for shifting input data to be written to said enabled cells in a circular fashion by a selectable amount in response to shift control signals; and

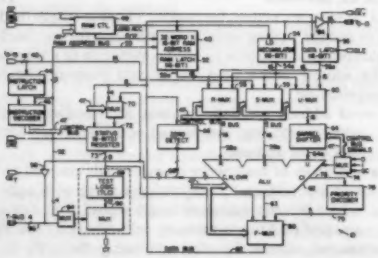
shift control means for translating said bit address into said shift control signals such that they direct said shifter means to right justify the data on said data outputs of said enabled cells and realign right justified input data to the data inputs of said enabled cells.

4,467,444

PROCESSOR UNIT FOR MICROCOMPUTER SYSTEMS

William J. Harmon, Jr., San Jose, and John R. Mick, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 1, 1980, Ser. No. 174,490
Int. Cl.[3] G06F *9/00*
U.S. Cl. 364—900 **15 Claims**



1. In a microcomputer system, including memory means for storing a plurality of multi-bit instruction words and sequencer means coupled to said memory means for controlling the sequence of instructions accessed from said memory means, a processor device coupled to said memory means and responsive to said instruction words for receiving and processing data words, the processor device comprising:

decoder means for receiving said instruction words and for generating therefrom a plurality of control signals;

storage means for temporarily storing said data words, said storage means including at least a first and a second memory element;

arithmetic-logic means having first, second, and third operand inputs operably coupled to said storage means for receiving said stored data words at said operand inputs and selectively performing arithmetic and logic operations thereon in response to said control signals;

combinatorial logic means interconnecting said storage means and only said third operand input for receiving and shifting stored data words; and

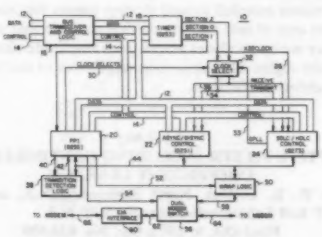
first multiplex means for selectively communicating said first and second memory elements to said first and second operand inputs and to said combinatorial logic means.

4,467,445

COMMUNICATION ADAPTER CIRCUIT

Mark W. Mueller; Thomas S. Parker, both of Cedar Park; Douglas M. Benignus, and James L. Frye, both of Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,300
Int. Cl.[3] G06F *3/00*; G06C *9/00*
U.S. Cl. 364—900 **8 Claims**



1. A multi-protocol communication adapter circuit for interfacing a processor with a modem for providing communication between the processor and a remote terminal, comprising:

a data transfer bus connected to said processor;

a plurality of control lines connected to said processor;

an asynchronous and bisynchronous control circuit connected to said data transfer bus and to said modem for controlling data transfer between said processor and said remote terminal under asynchronous and bisynchronous protocols, respectively, said asynchronous and bisynchronous control circuit connected to at least one of said control lines for receiving command signals from said processor;

an SDLC (Synchronous Data Line Control) control circuit connected to said data transfer bus and to said modem for controlling data transfer between said processor and said remote terminal under SDLC protocol, said SDLC control circuit connected to at least one of said control lines for receiving command signals from said processor, and having a clock recovery mechanism for generating a data clock signal;

means responsive to command signals from said processor for generating a clock select command signal representing the rate of data transfer between said processor and said remote terminal; and

a clock selection circuit connected to said SDLC control circuit to receive said data clock signal, and to said means for generating to receive a clock select command signal, said clock selection circuit also connected to said asynchronous and bisynchronous control circuit for providing

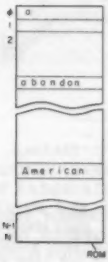
said data clock signal thereto during operation under said bisynchronous protocol, and for providing said data clock signal to said SDLC control circuit during operation under SDLC protocol.

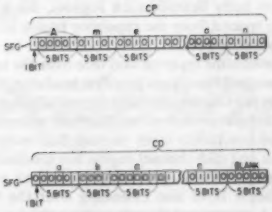
4,467,446

ELECTRONICALLY OPERATED MACHINE FOR LEARNING FOREIGN LANGUAGE VOCABULARY

Atsushi Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,074
Claims priority, application Japan, Oct. 12, 1980, 55-143254
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **7 Claims**





1. An electronic dictionary comprising:

word memory means for storing a plurality of words of a given language which words are defined by a plurality of letters, each stored word comprising a train of first code information including code information for the letters of the word and determining information which indicates whether the initial letter of the word is capitol or small;

processing means for converting the first code information for a desired word on the basis of the determining information of said word to a train of second code information which is longer than the first code information, wherein the second code information is character information for each letter and indicative of whether that letter is capital or small;

pattern generating means for generating a character pattern on the basis of the second code information processed by said processing means; and

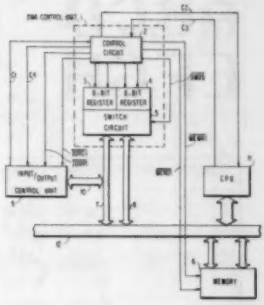
display means for displaying the character pattern generated by said pattern generating means.

4,467,447

INFORMATION TRANSFERRING APPARATUS

Toshiya Takahashi, and Yoshikuni Sato, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 319,016
Claims priority, application Japan, Nov. 6, 1980, 55-156352
Int. Cl.³ G06F *1/04*
U.S. Cl. 364—900 **6 Claims**



1. An information transferring apparatus comprising:

a first unit in which m-bit information is manipulated as a unit of handling,

a first bus consisting of m bit signal lines, which is coupled to said first unit,

a second unit in which 2 m-bit information is manipulated as a unit of handling,

a second bus consisting of 2 m bit signal lines, which is coupled to said second unit,

means for temporarily storing m bits of information,

an information transfer circuit for transferring information between said first and second units, and coupled to said first bus, said second bus and said storing means, and

a control circuit for controlling said information transfer circuit, and coupled to said first unit, said second unit, said storing means and said information transfer circuit, said control unit designating said second unit to send out 2 m-bit information to said second bus and controlling said information transfer circuit such that first m bits of said 2 m-bit information on said second bus are transferred to said storing means to be stored therein and at the same time the remaining m bits of said 2 m-bit information on said second bus are transferred via said first bus to said first unit and, thereafter, the stored m bits of information in said storing means are transferred via said first bus to said first unit, and said control unit designating said first unit to send out at least twice m-bit information to said first bus and controlling said information transfer circuit such that first m-bit information on said first bus is stored in said storing means, followed by transfer of the next m-bit information on said first bus via said second bus to said second unit and at the same time by transfer of the stored m-bit information from said storing means via said second bus to said second unit.

4,467,448

IMAGE ROTATE CONTROL CIRCUITRY

John L. Regehr, Stewartville, and Lee A. Sendelbach, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

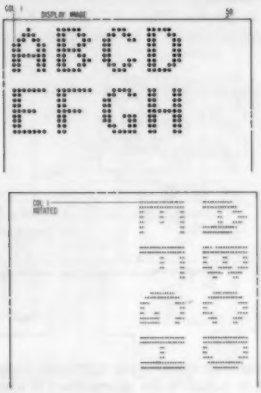
Filed Dec. 4, 1981, Ser. No. 327,307
Int. Cl.³ G01D *9/00*; G06F *15/00*
U.S. Cl. 364—900 **6 Claims**

1. Rotate control circuitry for a display copier system including display means for repetitively displaying data in a plurality of lines of video dots, with a retrace following each

repetition, and a printer having a plurality of elements for printing said data along a horizontal print line, said printer having a number of print elements at least as great as the number of said lines of video dots, comprising:

a read/write buffer having a capacity for storing a column of said data;

buffer write means for writing a column of said data into said



buffer one bit at a time corresponding to a video dot in each horizontal line of said video dots as said data is being displayed,

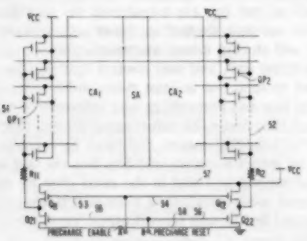
buffer read means for reading said column of data from said buffer as said display means is retracing; and means for transferring said column of data read from said buffer to said printer for printing said column of data along said horizontal print line.

4,467,449

SEMICONDUCTOR INTEGRATED CIRCUIT

Mineo Hayashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,412
Claims priority, application Japan, Sep. 1, 1980, 55-121481
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—51 **10 Claims**



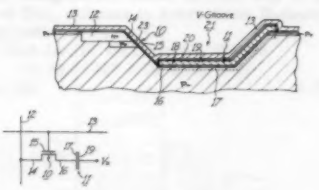
7. An integrated circuit comprising; means for receiving a first control signal, a first group of field effect transistors arrayed on a first region, a second group of field effect transistors arrayed on a second region separated from said first region, a first voltage line having a first portion located near said first region and a second portion located near said second region, and a switch circuit for simultaneously supplying gates of all of said first and second groups of transistors with a potential of said first voltage line in response to said first control signal, said switch circuit including first switch means located near said first region and adapted to operatively supply gates of all of said first group of transistors with said potential, second switch means located near said second region and adapted to operatively supply said gates of all of said second group of transistors with said potential, and means for simultaneously controlling said first and second switch means in response to said first control signal.

4,467,450

RANDOM ACCESS MOS MEMORY CELL USING DOUBLE LEVEL POLYSILICON

Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 803,495, Jun. 6, 1977, Pat. No. 4,225,945, which is a continuation-in-part of Ser. No. 648,594, Jan. 12, 1976, abandoned, and Ser. No. 722,841, Sep. 13, 1976, Pat. No. 4,240,092. This application Sep. 30, 1980, Ser. No. 192,388
The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.
Int. Cl.³ G11C *11/40, 11/24*
U.S. Cl. 365/149 **5 Claims**



1. A dynamic one-transistor memory cell having a field-effect transistor and a capacitor, comprising:

an impurity-doped capacitor region and an impurity-doped transistor region in a face of a semiconductor body, the capacitor region and the transistor region each being doped with impurity of type opposite that of the semiconductor body beneath such regions, the transistor region being spaced from the capacitor region along the face by a channel region,

a first conductor layer on said face over the capacitor region but insulted therefrom by a first insulator, the first conductor layer extending beyond the capacitor region along the face for connection to an electrical potential level,

a second conductor layer on said face over said transistor region and said channel region but insulated therefrom by a second insulator, providing a transistor gate, the second conductor layer also extending over the first conductor layer but insulated therefrom by a third insulator,

said first and second conductor layers being wholly insulated from one another, from said face of the semiconductor body, and from any other conductor layers, in the vicinity of said cell, by said first, second and third insulators.

4,467,451

NONVOLATILE RANDOM ACCESS MEMORY CELL

Norman E. Moyer, Balboa, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

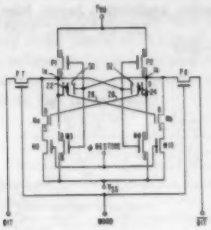
Filed Dec. 7, 1981, Ser. No. 328,324
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—156 **13 Claims**

1. A nonvolatile random access memory (NOVRAM) formed on a semiconductive medium, comprising:

two sets of series connected devices, each set comprising a load, a latch transistor of one conductivity-type having a control electrode, and a node connected to said latch transistor and to said load, each set being connected between two voltage supply lines, said node being con-

nected to the control electrode of the latch transistor of the opposite set; and

two groups of series connected elements connected between a power line and a respective one of said nodes, said



elements in each group comprising an isolation switch and a variable threshold voltage transistor having a floating electrode with means permitting charge tunneling between said floating electrode and one of said nodes.

4,467,452

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF FABRICATING THE SAME

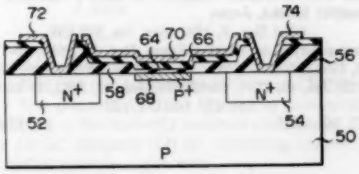
Shozo Saito; Yukimasa Uchida, both of Yokohama; Kazuhiko Hashimoto, Tokyo, and Norio Endo, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 15, 1981, Ser. No. 331,066

Claims priority, application Japan, Feb. 12, 1981, 56-19498; Feb. 12, 1981, 56-19499

Int. Cl.³ G11C *11/40*; H01L *29/78*

U.S. Cl. 365—184 **5 Claims**



1. A nonvolatile semiconductor memory device comprising:

a semiconductor region of a first conductivity type;

an impurity diffusion region of a second conductivity type formed in said semiconductor region;

an oxide film formed on said semiconductor region;

a gate insulating film with a memory function formed on said oxide film;

a gate electrode formed on said gate insulating film; and

an impurity layer of the first conductivity type formed in the vicinity of the surface of said semiconductor region under said oxide film, said impurity layer having an impurity profile in which the peak of impurity concentration is in the region which is a distance of 500 Å or less from the surface of said semiconductor region, thereby inhibiting electrons from being injected into said gate insulating film when a write voltage is applied to said inpurity diffusion region and said gate electrode.

4,467,453

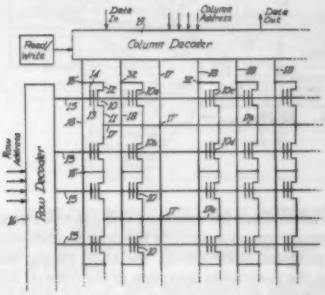
ELECTRICALLY PROGRAMMABLE FLOATING GATE SEMICONDUCTOR MEMORY DEVICE

Te-Long Chiu, Houston, and Jih-Chang Lien, Sugar Land, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 72,504, Sep. 4, 1979, Pat. No. 4,376,947. This application Feb. 28, 1983, Ser. No. 470,122

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—185 **3 Claims**



1. An electrically programmable, nonvolatile, floating gate, semiconductor memory array comprising: a plurality of MOS transistor devices formed in a face of a semiconductor body each having a source, a drain, a channel, a floating gate, and a control gate, each transistor device having a region in the semiconductor body adjacent the drain doped more heavily than the body, said region not extending the entire length of the channel, the transistor devices being arranged in an array of rows and columns; means for connecting the control gates of all devices in each row together to provide row lines; means connecting the sources of a plurality of said devices together to provide first column lines; means connecting the drains of all devices in each column together to provide second column lines; there being a plurality of second column lines for each first column line; means for selecting one of the row lines and applying a high voltage to it while applying a low voltage to the remaining row lines; means for selecting one of the second column lines and applying a high voltage to it while applying a low voltage to all of the other second column lines; means for applying low voltage to all of the first column lines.

4,467,454

HIGH-SPEED EXTERNAL MEMORY SYSTEM

Hirohiko Kurosu, Tokyo; Satoshi Nagata, Kodaira, and Yasuo Satake, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1981, Ser. No. 334,927

Claims priority, application Japan, Dec. 29, 1980, 55-187901

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—189 **6 Claims**

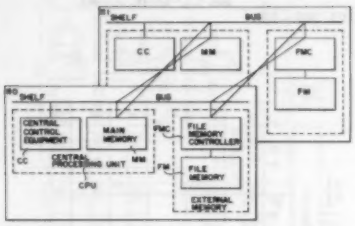
1. A high-speed external memory system having a microprogram control connected to a central processing unit which includes a main memory, said external memory system having a program mode for controlling a read/write operation of an external memory of the external memory system by said central processing unit and a direct memory access mode permitting a direct access to said main memory by said external memory, said external memory system comprising:

timing means, operatively connected to said microprogram control, for producing a burst timing interval during the direct memory access mode;

a first location address register, operatively connected to said microprogram control, said central processing unit and said external memory, for storing direct memory

access address information for accessing said external memory of the external memory system by the central processing unit in the direct memory access mode outside the burst timing interval;

a second location address register, operatively connected to said microprogram control, said central processing unit and said external memory, for storing program access



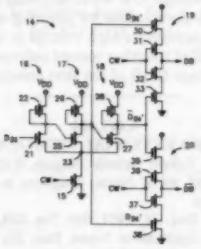
address information for accessing said external memory of the external memory system by the central processing unit in the program mode during the burst timing interval, whereby the read/write operation of the external memory of the external memory system can be executed by said central processing unit in the program mode during the execution of a direct memory access in the burst timing interval.

4,467,455

BUFFER CIRCUIT

Lal C. Sood, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1982, Ser. No. 438,085
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 **8 Claims**



1. In a memory having a common bus for input and output data wherein said data bus receives input data when a write enable signal and a chip select signal are present, the improvement comprising:

generating means for generating a chip write signal in response to receiving the write enable signal and the chip select signal, and

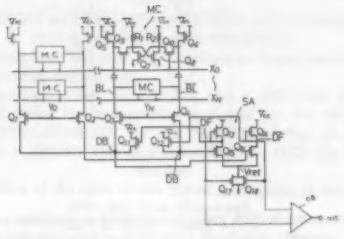
a buffer circuit for providing input data to the common bus in response to the chip write signal and providing a high impedance to the common bus until the chip write signal is received, and having interrupt means for preventing current from flowing through the buffer circuit until the chip write signal is received.

4,467,456

MEMORY CIRCUIT

Atsushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 1, 1982, Ser. No. 353,332
Claims priority, application Japan, Mar. 9, 1981, 56-33475
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—190 **8 Claims**



7. A memory circuit, comprising:

a memory cell array arranged in columns;

gate means, operatively connected to said memory cell array, for selecting the columns;

a pair of data bus lines operatively connected to said gate means and each having a potential;

sense means, operatively connected to said pair of data bus lines, for sensing the one of the pair of data bus lines which has the highest potential and generating a charge signal on an output terminal in dependence thereon; and

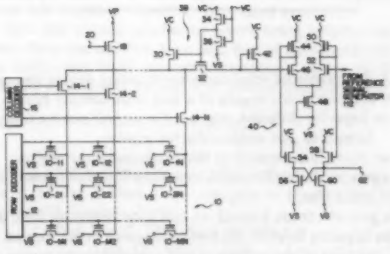
charging means, operatively connected to said pair of data bus lines and the output terminal of said sense means, for charging the one of the pair of data bus lines in dependence upon the charge signal.

4,467,457

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

Hiroshi Iwahashi, Yokohama, and Masamichi Asano, Musashino, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 9, 1981, Ser. No. 329,059
Claims priority, application Japan, Dec. 12, 1980, 55-175296; Mar. 3, 1981, 56-30213; Mar. 13, 1981, 56-36350; Apr. 17, 1981, 56-57929; Jul. 10, 1981, 56-107689; Jul. 10, 1981, 56-107694
Int. Cl.³ G11C *11/21*
U.S. Cl. 365—228 **17 Claims**



1. A nonvolatile semiconductor memory device comprising: memory array means, formed of a plurality of nonvolatile semiconductor memory elements each having a gate and a variable resistance path controlled by a respective gate with said elements arranged in columns and row to form of a matrix, for storing data in said gates to control the conductance of said

paths and for producing an output signal corresponding to said stored data in a selected one of said elements;

reference signal generator means for selectively generating either a first reference signal or a different second reference signal; and

sense means for comparing the level of said output signal from said memory array means to the level of the selectively generated reference signal from said reference signal generating means, and for producing a signal representing the result of that comparison.

4,467,458

READ-ONLY SEQUENCE CONTROLLER

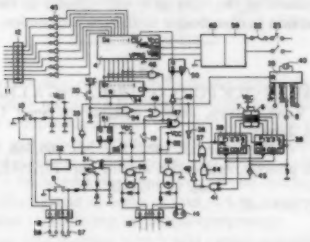
Yoshikazu Kuze, 31-3, Higashimagome 1-chome, Ohta-ku, Tokyo, Japan (143)

PCT No. PCT/JP79/00276, § 371 Date Jun. 26, 1981, § 102(e) Date Jun. 26, 1981, PCT Pub. No. WO81/01338, PCT Pub. Date May 14, 1981

PCT Filed Oct. 30, 1979, Ser. No. 279,980

Int. Cl.³ G11C *8/00*

U.S. Cl. 365—230 **2 Claims**



1. A read-only sequence controller comprising:

(a) an EPROM (4) having address lines and $\overline{CS}$/WE line;

(b) a first connector (5) for detachably connecting said EPROM to the read-only sequence controller;

(c) a second connector (12) for connecting outputs of said EPROM with an outside unit;

(d) a read clock pulse controller and gate means;

(e) said read clock pulse controller comprising a starting circuit (9, 31, 32) for producing a start signal;

(f) a clock pulse generating circuit (35) responsive to said start signal for producing clock pulses;

(g) a select switch (8) for selecting the frequency of the read clock pulses;

(h) a presettable counter (38, 39) for counting the read clock pulses;

(i) a preset code switch (6, 7) for selecting the number of the read clock pulse counted by said presettable counter;

(j) a binary counter (34) connected to the output of said presettable counter;

(k) said binary counter being connected to said address lines of said EPROM;

(l) said signal from said starting circuit resetting said binary counter, resetting said presettable counter and resetting the EPROM to resume its data output;

whereby said read clock pulse controller and gate means are adapted to control the operation of said EPROM.

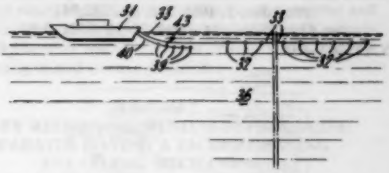
4,467,459

SEISMIC METHOD IMPROVING SIGNAL-TO-NOISE RATIO

William S. Currie, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 4, 1982, Ser. No. 337,032

Int. Cl.³ G01V *1/32*

U.S. Cl. 367—21 **6 Claims**

5. In marine type seismic surveying, a method of improving signal-to-noise ratio, comprising

towing a plurality of seismic generators past a predetermined location,

detonating each of said generators at said predetermined location by timing said detonations realtive to said towing speed,

recording one continuous seismogram of the seismic signals received from said detonations,

said seismogram having a time duration at least as long as the maximum reflection time of interest plus the total time between all of said detonations,

transforming said seismogram to the frequency domain,

constructing the frequency domain representation of said time intervals and using same to superimpose the frequency domain representations of the seismic signals resulting from each said detonation, and,

inversely transforming said superimposed frequency domain representations back to the time domain whereby a noise reduced seismogram is obtained.

4,467,460

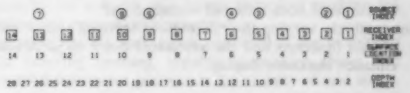
SEISMIC DATA ACQUISITION METHOD

Philip W. Johnson, Tulsa, Okla., assignor to The Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 61,713, Jul. 30, 1979, abandoned. This application Feb. 26, 1981, Ser. No. 238,316

Int. Cl.³ G01V *1/36*

U.S. Cl. 367—56 **10 Claims**



1. A method for the taking of seismic data, wherein the full-fold common depth point technique is altered to reduce the required number of records without substantial detrimental effects to the interpretability of the resulting seismic sections, comprising:

omitting the use of one or more of the normal full-fold seismic source points; and

arranging the remaining source points with respect to the detectors so that the resulting system of linear static correction equations remains continuously and at least minimally partially coupled according to common depth point, each seismic source and detector being at preselected locations during the time of source initiation and the taking of seismic data, thereby assuring seismic data with respect to common depth points;

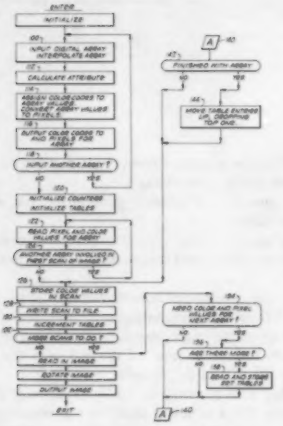
whereby no subset of equations according to common depth point exists which is mathematically independent from the remaining set of equations.

4,467,461

INTERACTIVE COLOR ANALYSIS OF GEOPHYSICAL DATA

George W. Rice and Beverly B. Stebens, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 5, 1981, Ser. No. 222,741
Int. Cl.³ G01V 1/34; G06F 15/36; G03C 5/04
U.S. Cl. 367—70 **31 Claims**



1. A method of interactive color analysis of geophysical data utilizing programmed digital computer and image processor to enable interpretive enhancement, comprising:

inputting geophysical data having known spatial relationship relative to a selected plane of investigation,

processing said input data to determine at least two selected attributes of said data;

quantifying said processed data in rasterized form where the at least two selected attributes of said data are represented as functions of both area and intensity wherein the attribute value between successive zero cross-overs is represented both in number of grid units within a selected grid scale and the color intensity within a selected intensity range;

displaying said at least two selected attributes of said data in rasterized form in color representation related to said functions of both area and intensity; and

interactively varying the relationship between one or more of said functions and the associated color to empirically enhance the color display.

4,467,462

SIGNAL DETECTION SYSTEM FOR USE IN AN OPTICALLY REPRODUCING APPARATUS

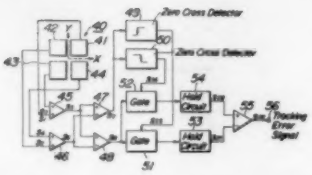
Tsutomu Shibata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,482
Claims priority, application Japan, Oct. 25, 1980, 55-149565
Int. Cl.³ G11B 7/12, 21/00
U.S. Cl. 369—45 **24 Claims**

1. In a signal detection system for use in an optical reproducing apparatus in which a light beam emitted from a light source is made incident by means of an objective lens upon a record medium having recorded thereon an information signal along one or more tracks and in which the light beam modulated by the information signal and collected by the objective lens is received by a light detector arranged in a far field of the track and comprising four light receiving regions divided about an optical axis of the incident light beam in orthogonal directions, one direction being in parallel with a track direction and the other direction being perpendicular to the track direction, the improvement comprising:

means for deriving a first sum S_5 of output signals S_1 and S_3 from diagonally aligned light receiving regions and a second sum S_6 of output signals S_2 and S_4 from remaining diagonally aligned light receiving regions;

means for deriving a sum signal S_7 of the first and second



sums S_5 and S_6 and a difference signal S_8 between the first and second sums S_5 and S_6;

means for generating sampling pulses at predetermined zero cross points of said sum signal S_7;

means for sampling said difference signal S_8 by said sampling pulses to generate sampled values and holding the sampled values; and

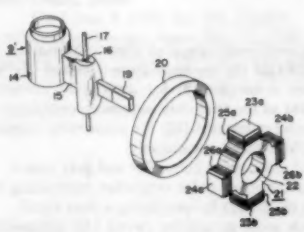
means for processing the sampled values to derive a tracking error signal representing the amount and direction of deviation of the light spot with respect to the track in a direction perpendicular to the track direction.

4,467,463

OPTICAL DEVICE FOR CONTROLLING A LIGHT BEAM

Hajime Yano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,668
Claims priority, application Japan, Apr. 27, 1981, 56-63706
Int. Cl.³ G11B 7/00
U.S. Cl. 369—45 **23 Claims**



1. An optical device for controlling a light beam, comprising:

a supporting member;

a movable member mounted on said supporting member for rectilinear and angular movements relative to the latter

an optical element carried by said movable member and acting on a light beam for effecting first and second kinds of control of said light beam in response to said rectilinear and angular movements, respectively;

a first magnet also carried by said movable member; and

a second magnet fixed relative to said supporting member and being shaped and magnetized to provide a magnetic field which reacts with said first magnet to yieldably retain said movable member, and said optical element carried thereby, against said rectilinear and angular move-

ments from a stable balanced position relative to said supporting member:

said angular movements are about an axis fixed relative to said supporting member and said rectilinear movements are parallel to said axis, said first magnet is a bar magnet which magnetized in a longitudinal direction extending substantially radially in respect to said axis, and said second magnet has a closed shape extending around said bar magnet and is magnetized in a direction substantially parallel to said longitudinal direction of the bar magnet.

4,467,464

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

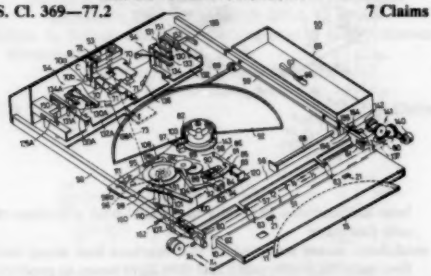
Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 8, 1982, Ser. No. 415,964

Claims priority, application Japan, Sep. 11, 1981, 56-143333

Int. Cl.³ G11B *17/04, 23/04*

U.S. Cl. 369—77.2 **7 Claims**



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for allowing said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

an inserting opening through which said case is inserted;

a turntable for rotating said rotary recording medium;

lid member locking means and rotary recording medium clamping means respectively provided at an innermost part of said reproducing apparatus opposite to said inserting opening with respect to said turntable;

jacket opening means provided in the vicinity of said inserting opening, capable of moving over said turntable between a position in the vicinity of said inserting opening and said innermost part of said reproducing apparatus, in response to an operation in which said case is inserted into and then extracted from said reproducing apparatus;

a rotary recording medium supporting member provided at a center part of said turntable, capable of moving upwards and downwards independently of said turntable, for rising to support an inner peripheral part of said rotary recording medium so that said rotary recording medium is supported above said turntable;

a supporting member elevator mechanism for elevating said rotary recording medium supporting member, said supporting member elevator mechanism operating so that said rotary recording member supporting member is in a raised state when said case or jacket is inserted into said reproducing apparatus;

driving means for operating said supporting member elevator mechanism, said driving means operating in one direction to operate said supporting member elevator mechanism so that said rotary recording medium supporting member is raised, operating in a reverse direction to operate said supporting member elevator mechanism so that said rotary recording medium supporting member is lowered, and operating in the reverse direction after said rotary recording medium is supported above said turntable by said rotary recording medium supporting member; and

control means for controlling said driving means to operate in said one direction when said control means detects the insertion of said jacket into said reproducing apparatus in a state where said rotary recording medium is supported by said rotary recording medium supporting member and is being lowered with said rotary recording medium supporting member operated by said driving means which is operating in said reverse direction.

4,467,465

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A JACKET OPENING ENLARGING MECHANISM

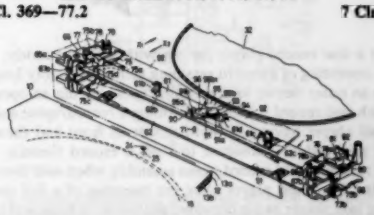
Takashi Saito, Ayase, and Toshio Hirano, Atsugi, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 26, 1982, Ser. No. 436,849

Claims priority, application Japan, Oct. 30, 1981, 56-162089[U]

Int. Cl.³ G11B *3/10, 3/58, 17/04*

U.S. Cl. 369—77.2 **7 Claims**



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case having a jacket provided with a space for accommodating said rotary recording medium and an opening through which said rotary recording medium can enter and leave said jacket, and a lid member inserted through said opening of said jacket for closing said opening, said reproducing apparatus comprising:

an inserting opening through which said case is inserted;

clamping means provided at an innermost part of said reproducing apparatus, for clamping and leaving behind said rotary recording medium within said reproducing apparatus when an operation is performed in which said case is inserted into said reproducing apparatus and said jacket is then extracted from said reproducing apparatus;

a turntable for rotating said rotary recording medium left within said reproducing apparatus;

jacket opening enlarging means provided in the vicinity of said inserting opening, capable of moving above said turntable between a position in the vicinity of said inserting opening and the innermost part of said reproducing apparatus according to the insertion and extraction of said case, for engaging with said jacket to enlarge said opening according to the movement of said enlarging means towards the innermost part of said reproducing apparatus from the vicinity of said inserting opening; and

locking means provided at a position substantially center along right and left directions of said enlarging means, for normally locking said enlarging means in the vicinity of said inserting opening to restrict the movement of said enlarging means towards the innermost part of said reproducing apparatus,

said locking means being maintained in its original locking state upon insertion of said case or jacket in a state where a front edge of said case or jacket is slanted with respect to said enlarging means, and assuming a locking released state only when said front edge is parallel with said enlarg-

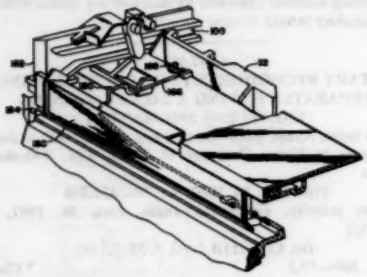
ing means and said locking means is pushed by said front edge.

4,467,466

VIDEO DISK PLAYER HAVING DOOR LOCK MECHANISM

Larry M. Hughes, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1983, Ser. No. 464,085
Int. Cl.³ G11B *17/04*
U.S. Cl. 369—77.2 **18 Claims**



1. In a disc record player for use with a record caddy; said caddy consisting of a record retaining spine removably located within an outer sleeve; said retaining spine having an opening in which said record is received forming a record/spine assembly; said player having an input slot at its front end through which said caddy is inserted to load a record therein; said player retaining said record/spine assembly when said sleeve is extracted from said player after the insertion of a full caddy therein; said player being provided with a set of front and back record receiving pads for selectively supporting said retained record/spine assembly; said record receiving pads being subject to disposition in a retracted position to support a retained record and an advanced position to allow passage of said retained record to a rotatable turntable located underneath said receiving pads; said caddy input slot being equipped with a door coupled to said front receiving pads by a compliant member; said caddy door yieldably closing and opening said input slot when said front receiving pads are respectively advanced and retracted; the improvement comprising a raised portion disposed on said compliant coupling member located and dimensioned such that it engages said caddy door to prevent it from fully opening when said record receiving pads are advanced, thereby blocking insertion of a caddy or a sleeve into said player; the retraction of said front receiving pads displacing said raised portion on said compliant coupling member to a location such that it does not block said caddy door from fully opening.

4,467,467

VIDEO RECORDER-PLAYBACK MACHINE

Richard L. Wilkinson, and George Vitale, both of Torrance, Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 198,693, Oct. 20, 1980, abandoned. This application May 4, 1983, Ser. No. 492,962
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—111 **48 Claims**

1. A recorder-playback machine for recording and/or playing back information from an information storage disc, comprising:

a machine base;

a "write" laser secured to said machine base, said "write" laser operative to generate a first light beam directed along a first path for use in recording information upon the disc;

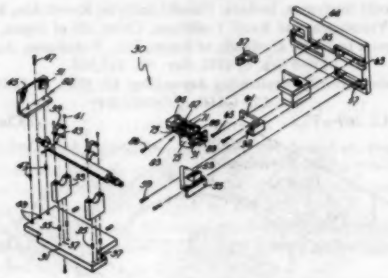
means for supporting the disc for rotation relative to said machine base;

an optics carriage movably mounted with respect to said machine base;

an optical record-playback head mounted on said carriage for movement therewith;

a "read" laser mounted on said carriage for movement therewith, said "read" laser operative to generate a second light beam directed along a second path in fixed optical alignment with said head for passage of said second light beam through said head and for focusing thereof by said head upon the disc for use in playing back information from the disc;

means for moving said carriage with respect to said machine



base and said disc generally in parallel with a portion of said first path;

modulator means mounted on said machine base along said first path for interrupting said first light beam to produce a modulated light beam representative of the information to be recorded;

a first condensing lens for focusing said first light beam for passage through said modulator means, and a second condensing lens for directing said modulated light beam along a length of said first path to said carriage, said first path length including said first path portion; and

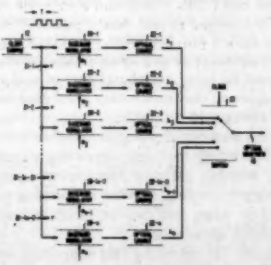
means on said carriage in optical alignment with said first light beam for reflecting said first light beam through said head regardless of the position of said carriage for focusing of said first light beam by said head upon the disc.

4,467,468

OPTICAL COMMUNICATION SYSTEM

Stewart E. Miller, Locust, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1981, Ser. No. 334,908
Int. Cl.³ H04B *9/00*
U.S. Cl. 370—3 **5 Claims**



1. An optical communication system comprising

n signal sources, where n is a number of at least three, each

source generating an output pulse train at a different wavelength, and the pulses in any one of the generated pulse trains are never time coincident with the pulses in any other generated pulse train;

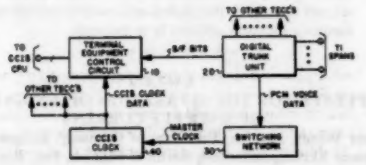
means for time-division multiplexing the generated pulse trains from said sources onto an optical fiber; and

receiver means coupled to said fiber for separating the output pulses according to the generating signal source solely by wavelength-division demultiplexing the received signal, said receiver means comprising wavelength selective filters connected in cascade.

4,467,469
CIRCUITRY FOR RECOVERY OF DATA FROM CERTAIN BIT POSITIONS OF A T1 SPAN

Krikor A. Krikor, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Oct. 19, 1982, Ser. No. 435,196
Int. Cl.³ H04J 3/06
U.S. Cl. 370—58 8 Claims



1. In a digital switching system having a CPU and a plurality of T1 spans, voice data of said T1 spans being switched by said system, circuitry for recovering CCIS data from any of said plurality of T1 spans, said circuitry comprising:

a digital switching network including a master clock providing a first signal of a first frequency;

a CCIS clock connected to said digital switching network and said master clock, said CCIS clock being operated in response to said first signal to produce a second signal of a second frequency;

a digital trunk unit connected between said plurality of T1 spans and said switching network, said digital trunk unit operated to transfer said voice data of said T1 spans to said digital switching network;

said digital trunk unit further operated to transmit a third signal at a particular frequency;

means for converting connected to said digital trunk unit and to said CCIS clock, said means for converting operated in response to said third signal and said second signal to produce a fourth signal at periodic time intervals;

said fourth signal of any of said time intervals being values for a first sequence of particular bit positions of one said T1 span;

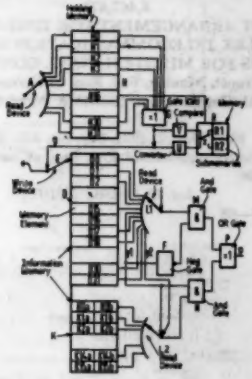
means for setting predetermined values for a second sequence of bit positions; and

means for comparing connected to said means for converting and to said means for setting, said means for comparing operated in response to said first and said second sequences of bit positions to produce a fifth signal of a first value for equality of said values of said first and second sequences of bit positions for indicating the detection of a CCIS data bit or alternatively to produce said fifth signal of a second value for inequality of said values of said first and second sequences of bit positions.

4,467,470
CIRCUIT ARRANGEMENT FOR T.D.M. TELECOMMUNICATION EXCHANGE SYSTEM, COMPRISING T.D.M. LINES WHOSE TIME CHANNELS SERVE PARTIALLY FOR MESSAGE CONNECTIONS AND PARTIALLY FOR THE TRANSMISSION OF SIGNALLING INFORMATION

Oskar G. Waas, Zurich, Switzerland, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,473
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122300
Int. Cl.³ H04J 3/00
U.S. Cl. 370—66 5 Claims



1. A circuit arrangement for a time-division multiplex pulse code modulation (PCM) telecommunication exchange system in which time-division multiplex lines have pluralities of time channels with each plurality forming a time-division multiplex in which successively-following time slots are assigned to the time channels and are arranged in pulse frames and the same respective time slot is assigned to each of the individual time channels in various, successive pulse frames; and a respective signal channel per time-division multiplex and serving as one of its time channels for the transmission of switching identifiers individually assigned to the remaining time channels of the respective time-division multiplex, a plurality of pulse frames forming a super pulse frame and a plurality of super pulse frames successively follow one another, the signal channels of the successive pulse frames of a super pulse frame being combined in the same manner; and time-division multiplex switching matrices operable to individually switch the time channels of an incoming time-division multiplex line to the time channels of an outgoing time-division multiplex line, each of said time-slot multiples comprising

a first information memory including a plurality of first memory elements for storing respective PCM message words received in message channels over an incoming time-division multiplex line;

a second information memory including a plurality of second memory elements for storing PCM identifier signal words received in signal channels over an incoming time-division multiplex line;

a write device for selectivlely connecting the incoming time-division multiplex line to said first and second memory elements;

write control means, including a holding memory comprising a plurality of third memory elements for storing memory element addresses of said first and second information memories, and a holding memory read device for cyclically reading said addresses in the sequence of the time slot of the time slot of the channels of the incoming time-division multiplex line, said write control means con-

nected to said write device for selectively operating said first and second information memories, in accordance with the memory element addresses, to store the respective PCM words; and

information memory read means connected to said first information memory and operable in the sequence of time slots of the time channels of an outgoing time-division multiplex line to sequentially provide thereto respective PCM message words, and connected to said second information memory to read therefrom upon attaining a signal channel time slot to provide a PCM identifier signal word to the outgoing time division multiplex line.

4,467,471

CIRCUIT ARRANGEMENT FOR TIME-DIVISION MULTIPLEX TELECOMMUNICATION SWITCHING SYSTEMS FOR MULTI-CHANNEL CONNECTIONS

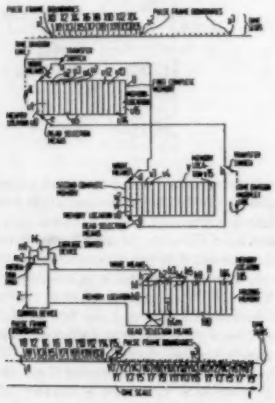
Marcel A. Troost, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,705

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045606

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—68 **9 Claims**



1. In a time-division multiplex telecommunication switching system, particularly a pulse code modulation telephone switching system, of the type having a time-division switching matrix by way of which, in comparison to a connection loading only a respective single time channel, connections loading two or more time channels can be produced for the purpose of attaining a greater bandwidth and/or a finer amplitude gradation, and in which for the switching of time channels of an incoming time-division multiplex line belonging to a multi-channel connection to corresponding time channels of an outgoing time-division multiplex line by way of a first memory for receiving partial information maximally transmittable in a pulse form, the original chronological sequence of the partial information incoming per pulse frame via the time channels is retained upon their transmission, and in which the write operation which serves for receiving the incoming partial information at memory locations of the first memory only per incoming time channel is cyclically executed and the read operation which serves for relaying the partial information only via the outgoing time channels is executed according to switching data which indicate the assignment of the outgoing time channels to the incoming time channels and are stored per outgoing time channel at memory locations of a holding memory in the form of memory location addresses of the first memory, the improvement therein comprising:

a second memory connectible to the incoming and outgoing multiplex lines;

means connected to said first and second memories and operable to condition one of said first and second memories to the write mode during a first write pulse frame and the other of said first and second memories to the write mode during a succeeding, second pulse frame;

means for providing a chronological offset in a lagging direction between the time channels of an incoming time-division multiplex line and the write pulse frames by a whole multiple of the duration of a time slot corresponding to a time channel so that, in accordance with the chronological offset, the partial information arriving within one pulse frame are partially stored in a second row of last memory locations of one of said first and second memories and are partially stored in a first row of first memory locations of the other of said first and second memories;

means for reading the partial information stored in the memory locations of said first and second memories within the next-successive pulse frame of the incoming time-division multiplex line for transmission via outgoing time channels; and

linkage switch means for deriving from the first and second memory location addresses of the outgoing time channels in the holding memory location addresses corresponding thereto, in conjunction with the appertaining holding memory location address as to in which of the first and second memories the partial information stored under this memory location address is to be read.

4,467,472

DIPLEXER FOR THE SEPARATION OF A SIGNAL AND OF A SUPPLY CURRENT

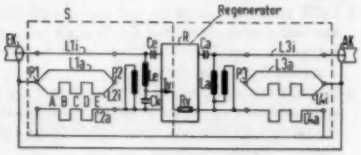
Peter Wendt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,260

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3122084

Int. Cl.³ H03F *1/00*

U.S. Cl. 370—97 **14 Claims**



1. A diplexer for separation of a signal current and a supply current for use with remotely fed intermediate regenerators or repeaters of broad-band transmission systems having connection cables connected to the diplexer, comprising:

an inductor means for supplying current from the connection cable to the regenerator or repeater and a capacitor which connects a current supply terminal of the regenerator or repeater to a reference potential of the regenerator or repeater;

a homogeneous line with an intrinsic impedance corresponding to that of the connection cable connected thereto;

inner and outer conductors of the homogeneous line being connected at one end of the line to corresponding conductors of the connection cable and at the other end of the line, the inner conductor being coupled to a signal terminal of the regenerator or repeater;

an inhomogenous line;

the outer conductor of the homogenous line being connected to an inner conductor of the inhomogenous line;

the inhomogenous line having alternating sections of low and high intrinsic impedance in comparison to the connection cable;

a terminal of an outer conductor of the inhomogeneous line adjacent to the connection cable being conductively connected with a shielding of the diplexer; and

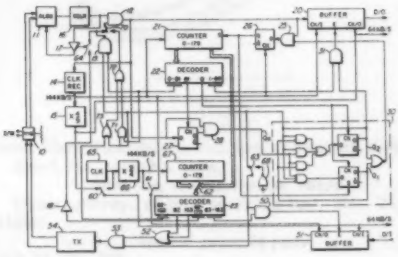
another terminal of the outer conductor at an opposite end of the inhomogeneous line being connected to said reference potential of the regenerator or repeater.

4,467,473

TIME COMPRESSION MULTIPLEX DIGITAL TRANSMISSION SYSTEM

Ephraim Arnon; Michael W. Chomik, both of Nepean, and Christopher J. Barlow, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 30, 1982, Ser. No. 403,311
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 **4 Claims**



1. In a digital transmission system comprising;

means for transmitting bursts of digital signals of fixed length and at fixed frame intervals, each burst including initial and final synchronization bits at the beginning and ending respectively, of each burst; and

means for receiving the bursts of digital signals, including clock recovery means for generating clock pulses synchronized to bits of the digital signals received from the transmitting means;

the improvement comprising in the receiving means:

means, responsive to the clock pulses, for generating first and second one bit period gating signals coincident with the anticipated reception of the initial and final synchronization bits respectively in each frame; and

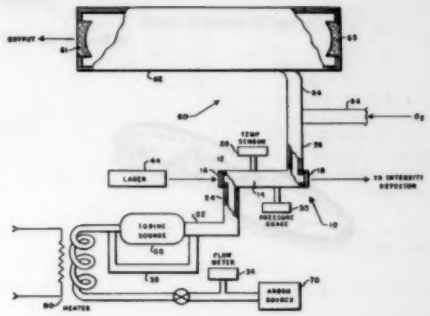
means for generating a signal confirming frame synchronization, in response to the simultaneous occurrence of the second one bit period gating signal and the final synchronization bit of one frame, and the first one bit period gating signal and the initial synchronization bit of the following frame.

4,467,474

HALOGEN MASS FLOW RATE DETECTION SYSTEM

Steven J. Davis, and Leonard Hanko, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

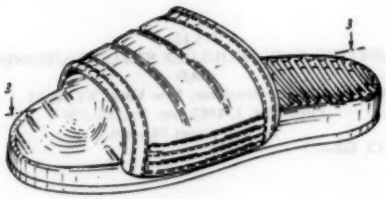
Division of Ser. No. 237,021, Feb. 23, 1981, Pat. No. 4,421,408. This application Sep. 19, 1983, Ser. No. 533,276
Int. Cl.³ H01S 3/095
U.S. Cl. 372—89 **9 Claims**



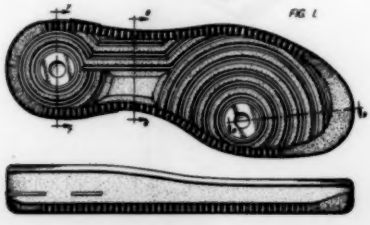
1. In an oxygen-iodine chemical laser having a resonant cavity, means connected to said resonant cavity containing iodine crystals therein, means connected to said iodine crystal containing means for passing an inert gas therethrough thereby entraining an unknown density of iodine and forming an iodine-inert gas mixture, and means for feeding excited oxygen into said iodine-inert gas mixture in order to combine said oxygen with said iodine-inert gas mixture for subsequent passage into said resonant cavity, the improvement therein of a means interconnected between said iodine containing means and said oxygen feeding means for rapidly, accurately and reliably detecting the mass flow rate of said iodine into said resonant cavity, said mass flow rate detecting means comprising: an absorption cell; means connected to said absorption cell for passing either said inert gas or said iodine-inert gas mixture therethrough; means connected to said absorption cell for passing said inert gas or said iodine-inert gas mixture out of said absorption cell and for allowing the subsequent mixing of said iodine-inert gas mixture with said oxygen; means adjacent one end of said absorption cell for providing a beam of electromagnetic radiation at a predetermined wavelength in the bound-continuum region and at a predetermined power, and for passing said beam of electromagnetic radiation through said absorption cell; and, means adjacent the other end of said absorption cell for receiving said beam of electromagnetic radiation passing through said absorption cell and detecting the intensity thereof, whereby a relationship between the detected intensity of said electromagnetic beam of radiation passing through only said inert gas and the detected intensity of said electromagnetic beam of radiation passing through said iodine-inert gas mixture can be established, said relationship being utilized in determining said iodine mass flow rate.

275,144
BOOT
Alfred D. Radford, Combe, near Lansport, England, assignor to Clarks Limited, Street, England
Filed May 3, 1982, Ser. No. 374,381
Claims priority, application United Kingdom, Mar. 12, 1982, 1005563
Term of patent 14 years
U.S. Cl. D2—274

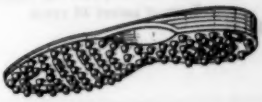
275,145
SANDAL
Ernst Glatz, Ruesselsheim, Fed. Rep. of Germany, assignor to Scholl, Inc., Memphis, Tenn.
Filed Aug. 5, 1982, Ser. No. 405,457
Claims priority, application Switzerland, Feb. 26, 1982, 112267
Term of patent 14 years
U.S. Cl. D2—283



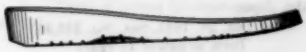
275,146
SHOE OUTSOLE
Bruce J. Kilgore, Exeter, N.H., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 25, 1982, Ser. No. 381,764
Term of patent 14 years
U.S. Cl. D2—320



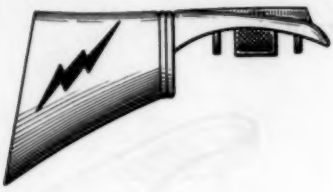
275,147
SOLE FOR A SPORTS SHOE
Roger Phillpott, Kingswood, England, assignor to Stuburt Sports Footwear Limited, Bristol, England
Filed Aug. 18, 1982, Ser. No. 409,036
Claims priority, application United Kingdom, Apr. 30, 1982, 1006481
Term of patent 14 years
U.S. Cl. D2—320



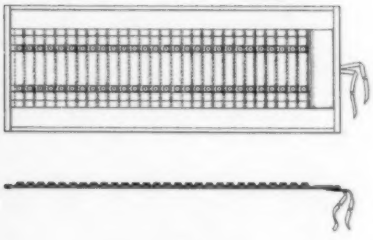
275,148
SHOE SOLE
Charles Bergmans, Sprang Capelle, Netherlands, assignor to Clarks of England, Inc., Norwalk, Conn.
Filed Aug. 23, 1982, Ser. No. 410,211
Term of patent 14 years
U.S. Cl. D2—320



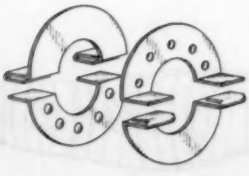
275,149
ILLUMINATED HAND PROTECTOR
John M. Winkler, 1943 S. 89th St., Apt. #2, West Allis, Wis. 53227
Filed Nov. 20, 1981, Ser. No. 323,214
Term of patent 14 years
U.S. Cl. D2—361



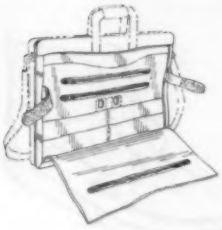
275,150
HOLDER FOR A NEEDLE CRAFT KIT
Jesse V. Haws, 3233 South, 5th Ave., Pocatello, Id. 83204
Filed Mar. 15, 1982, Ser. No. 358,249
Term of patent 14 years
U.S. Cl. D3—23



275,151
POMPON MAKER OR THE LIKE
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed Dec. 29, 1981, Ser. No. 335,463
Term of patent 14 years
U.S. Cl. D3—26



275,152
FRONT PANEL FOR A PORTFOLIO
Edward L. Gerch, Chicago, Ill., assignor to Kingport, Ltd., Evanston, Ill.
Filed Mar. 25, 1982, Ser. No. 361,623
Term of patent 14 years
U.S. Cl. D3—71

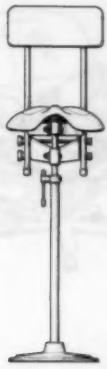


275,153
CARRYING CASE SHOULDER STRAP CUSHIONING PAD
Robert Weinreb, 510 Broadway, New York, NY 10012
Filed Mar. 1, 1982, Ser. No. 353,626
Term of patent 14 years
U.S. Cl. D3—77

275,154
SUPPORT STAND FOR USE IN PROTECTING GRINDING DISCS
Elmer Stolber, 3950 Prescott Ave., Lyons, Ill. 60534
Filed Jun. 21, 1982, Ser. No. 390,259
Term of patent 14 years
U.S. Cl. D6—431

275,155
SURGEON'S CHAIR
Milton O. Carlin, 4115 S. Zunis, Tulsa, Okla. 74105
Filed Apr. 19, 1982, Ser. No. 369,503
Term of patent 14 years
U.S. Cl. D6—353

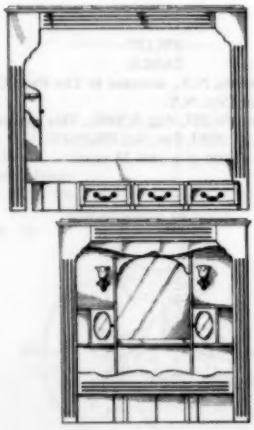
275,156
SURGEON'S CHAIR WITH BACKREST
Milton O. Carlin, 4115 S. Zunis, Tulsa, Okla. 74105
Filed Apr. 19, 1982, Ser. No. 369,504
Term of patent 14 years
U.S. Cl. D6—354



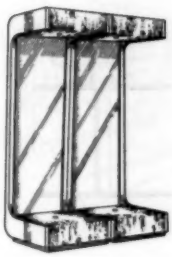
275,157
TABLE
Leon Rosen, Scarsdale, N.Y., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Division of Ser. No. 290,207, Aug. 5, 1981,. This application Sep. 28, 1983, Ser. No. 536,635
Term of patent 14 years
U.S. Cl. D6—483

275,158
CHAIR
Robert Aronowitz, 40 E. 84th St., New York, N.Y. 10028, and Bernard Katzanek, 100 Caton Ave., Brooklyn, N.Y. 11218
Filed Jan. 25, 1982, Ser. No. 342,576
Term of patent 14 years
U.S. Cl. D6—366

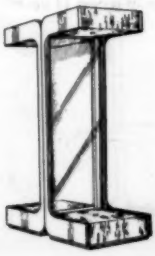
275,159
BED FRAME
Grover W. Slaton, Hermosa Beach, and J. Jesus Velazquez, Hawethorn, both of Calif., assignors to Pacific Frames, Inc., Carson, Calif.
Filed Mar. 24, 1982, Ser. No. 361,362
Term of patent 14 years
U.S. Cl. D6—384



275,160
DISPLAY FIXTURE
Robert N. Shelton, Leominster, Mass., assignor to Foster Grant Corporation, Leominster, Mass.
Filed May 15, 1980, Ser. No. 150,374
Term of patent 14 years
U.S. Cl. D6—483

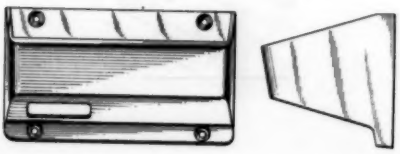


275,161
DISPLAY FIXTURE
Robert N. Shelton, Leominster, Mass., assignor to Foster Grant Corporation, Leominster, Mass.
Filed May 14, 1980, Ser. No. 151,043
Term of patent 14 years
U.S. Cl. D6—480



275,162
TIE RACK OR THE LIKE
William D. Ritchey, 1617 M St., Bedford, Ind. 47421
Filed Jul. 22, 1982, Ser. No. 400,743
Term of patent 14 years
U.S. Cl. D6—317

275,163
POWER TOOL HOLDER
Edward D. Levy, Franklin Lakes, and Michael P. Ballone, New Providence, both of N.J., assignors to Gee Associates, Fort Lee, N.J.
Filed Sep. 29, 1982, Ser. No. 426,792
Term of patent 14 years
U.S. Cl. D6—553



275,164
TABLE OR SIMILAR ARTICLE
David G. Buck, Box 19975-A, Cipole Rd., Sherwood, Oreg. 97140
Filed Apr. 21, 1982, Ser. No. 370,473
Term of patent 14 years
U.S. Cl. D6—449

275,165
FOOD STORAGE CONTAINER OR SIMILAR ARTICLE
Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 26, 1982, Ser. No. 342,909
Term of patent 14 years
U.S. Cl. D7—1

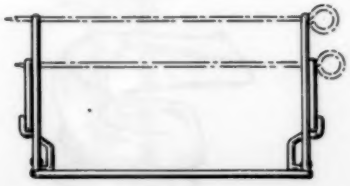
275,166
KNIFE
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Gardena, Calif.
Filed Jul. 22, 1982, Ser. No. 400,855
Term of patent 14 years
U.S. Cl. D7—137

275,167
FORK
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Gardena, Calif.
Filed Jul. 22, 1982, Ser. No. 400,856
Term of patent 14 years
U.S. Cl. D7—137

275,168
ARTICLE OF FLATWARE
Tachio Watanabe, Tokyo, Japan, assignor to Ryoko Company Limited, Tokyo, Japan
Filed Mar. 12, 1982, Ser. No. 357,676
Claims priority, application Japan, Oct. 9, 1981, 56-45117
Term of patent 14 years
U.S. Cl. D7—151

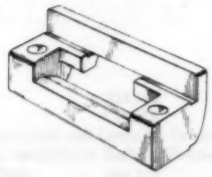
275,169
ARTICLE OF FLATWARE
Tachio Watanabe, Tokyo, Japan, assignor to Ryoko Company Limited, Tokyo, Japan
Filed Mar. 12, 1982, Ser. No. 357,677
Claims priority, application Japan, Oct. 1, 1981, 56-43816
Term of patent 14 years
U.S. Cl. D7—151

275,170
ROAST SPIT
Wade Bentson, San Francisco, Calif., assignor to Amco Corporation, Chicago, Ill.
Filed Jul. 12, 1982, Ser. No. 397,548
Term of patent 14 years
U.S. Cl. D7—409



275,171
GLASS CUTTER
Mellen-Thomas Benedict, 4760 Yadkin Rd., Fayetteville, N.C. 28303
Filed May 14, 1982, Ser. No. 378,055
Term of patent 14 years
U.S. Cl. D8—51

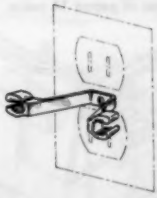
275,172
RELEASABLE HINGE AND LATCH CONNECTOR ELEMENT
Gerald A. Kwan, Pasadena; John Lehne, Hacienda Heights, and Ronald E. Wooten, Sunnymead, all of Calif., assignors to Le Van Specialty Co., Inc., City of Industry, Calif.
Filed Jan. 15, 1982, Ser. No. 339,324
Term of patent 14 years
U.S. Cl. D8—323



275,173
WEATHERPROOF COVER FOR ELECTRICAL OUTLET OR THE LIKE
Louis L. Mastro, Milford, and William C. Traylor, Birmingham, both of Mich., assignors to Square D Company, Palatine, Ill.
Filed Dec. 18, 1981, Ser. No. 332,077
Term of patent 14 years
U.S. Cl. D8—353

275,174
ELECTRICAL CORD RETAINER CLIP
Ernest Rolli, Brookville, Ohio, assignor to Erco Mold Inc., Brookville, Ohio
Filed Apr. 9, 1982, Ser. No. 367,186
Term of patent 14 years
U.S. Cl. D8—356

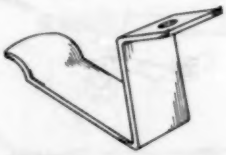
275,175
ELECTRICAL CORD RETAINER CLIP
Ernest P. Rolli, Jr., Brookville, Ohio, assignor to Erco Mold Inc., Brookville, Ohio
Filed Jul. 6, 1982, Ser. No. 395,562
Term of patent 14 years
U.S. Cl. D8—356



275,176
POLY-V PULLEY
Yukio Kanemitsu, Kobe, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-Sho, Japan
Filed Jun. 8, 1982, Ser. No. 386,300
Claims priority, application Japan, Dec. 16, 1981, 56-55938
The portion of the term of this patent subsequent to Mar. 1, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—360

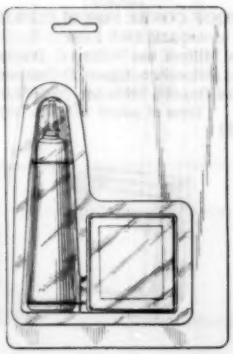
275,177
MOUNTING CLIP
Jesus R. Villanueva, Justice, Ill., assignor to The Cooperative Marketing Co., Elk Village, Ill.
Filed Jul. 20, 1982, Ser. No. 400,100
Term of patent 14 years
U.S. Cl. D8—373

275,178
BRACKET
John W. Yeater, 28125 CR 52,R3, Nappanee, Ind. 46550
Filed Sep. 17, 1982, Ser. No. 419,568
Term of patent 14 years
U.S. Cl. D8—380

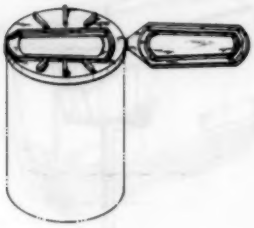


275,179
PACKAGING CONTAINER FOR FOOD OR THE LIKE
Kenneth B. Spencer, Barrington, and Ali R. Caner, Woodstock, both of Ill., assignors to American Can Company, Greenwich, Conn.
Filed Jun. 19, 1981, Ser. No. 275,316
Term of patent 14 years
U.S. Cl. D9—370

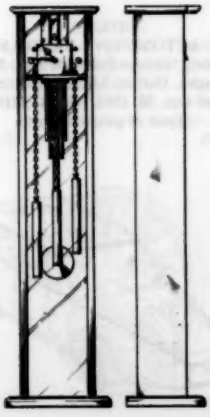
275,180
DISPLAY PACKAGE
Steven L. Bakus, Vernon Hills, Ill., assignor to Felt Products Mfg. Co.
Filed Apr. 5, 1982, Ser. No. 365,293
Term of patent 14 years
U.S. Cl. D9—415



275,181
CONTAINER LID
I. Thomas Jeffries, P.O. Box 6843, Louisville, Ky. 40207, and Peter L. Droppelman, #11 Belknap Beach, Prospect, Ky. 40059
Filed Jan. 11, 1982, Ser. No. 338,221
Term of patent 14 years
U.S. Cl. D9—438



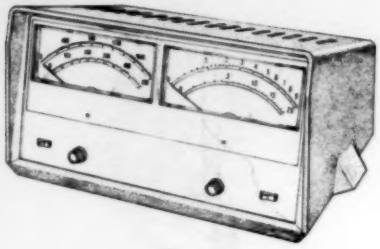
275,182
CLOCK
Steven M. Demirjian, and Laura M. Demirjian, both of Arlington, Mass., assignors to Boston Machine & Tool Mfg. Co., Melrose, Mass.
Filed Mar. 12, 1982, Ser. No. 357,822
Term of patent 14 years
U.S. Cl. D10—16



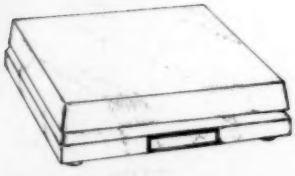
275,183
SMOKE DETECTOR TESTER
Michael F. Minozzi, Jr., 10 Mein Dr., New City, N.Y. 10956
Filed Dec. 28, 1981, Ser. No. 334,532
Term of patent 14 years
U.S. Cl. D10—46

275,184
TESTER FOR MOTOR STATORS AND ROTORS
Don E. Stafford, Lexington, Ky., assignor to Lexseco, Inc., Louisville, Ky.
Filed Jun. 14, 1982, Ser. No. 387,804
Term of patent 14 years
U.S. Cl. D10—75

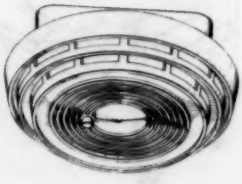
275,185
EXHAUST ANALYZER
William M. Noe, Buffalo Grove, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.
Filed Feb. 16, 1982, Ser. No. 348,946
Term of patent 14 years
U.S. Cl. D10—81



275,186
SCALE BASE
Eric A. Gard, Lancaster, Pa., assignor to Pennsylvania Scale Company, Leola, Pa.
Filed Aug. 23, 1982, Ser. No. 410,323
Term of patent 14 years
U.S. Cl. D10—94

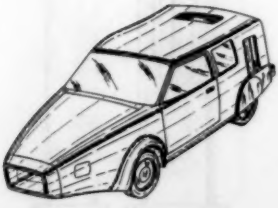


275,187
SMOKE DETECTOR
John S. Skarman, Newport Beach, Calif., assignor to Gateway Scientific, Inc., Costa Mesa, Calif.
Filed Aug. 19, 1982, Ser. No. 409,642
Term of patent 14 years
U.S. Cl. D10—106

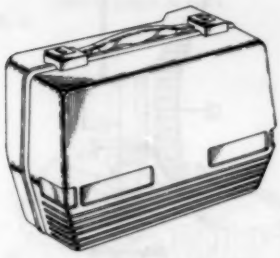


275,188
PORTABLE TRAFFIC SIGNAL
John A. McNaughton, Jr., Tallmadge, Ohio, assignor to J. A. McNaughton, Inc., Akron, Ohio
Filed Oct. 26, 1981, Ser. No. 315,251
Term of patent 14 years
U.S. Cl. D10—115

275,189
AUTOMOTIVE VEHICLE
Gordon M. Buehrig, Grosse Pointe Woods, Mich., assignor to Richard P. Kughn, Detroit, Mich., a part interest
Filed Oct. 30, 1981, Ser. No. 316,874
Term of patent 14 years
U.S. Cl. D12—91



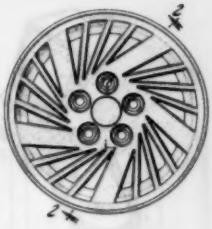
275,190
LUGGAGE CASE FOR MOTORCYCLE
Klaus V. Gevert, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Sep. 11, 1981, Ser. No. 301,136
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 12 442
Term of patent 14 years
U.S. Cl. D12—158



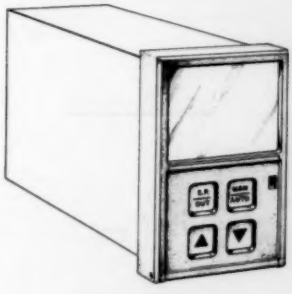
275,191
AIR DAM
Ralph J. Amprim, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 11, 1981, Ser. No. 329,742
Term of patent 14 years
U.S. Cl. D12—181

275,192
VEHICLE WHEEL COVER
John R. Schinella, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 13, 1982, Ser. No. 377,830
Term of patent 14 years
U.S. Cl. D12—211

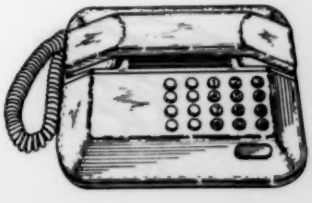
275,193
VEHICLE WHEEL
John R. Schinella, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 12, 1982, Ser. No. 407,330
Term of patent 14 years
U.S. Cl. D12—211



275,194
PROCESS CONTROLLER PANEL
John F. Walker, Pipersville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 3, 1982, Ser. No. 373,914
Term of patent 14 years
U.S. Cl. D13—12



275,195
TELEPHONE
Evert Endt, Paris, France, assignor to Telecommunications Radioelectriques & Telephoniques, Paris, France
Filed Feb. 1, 1982, Ser. No. 344,851
Claims priority, application France, Jul. 30, 1981, 812671
Term of patent 14 years
U.S. Cl. D14—53



275,196

DESK-TOP VIDEO INTERCOM

J. C. Huang, 10th Flr. No 33, Ann-Ho Rd., Taipei, Taiwan, assignor to J. C. Huang, Taipei, Taiwan

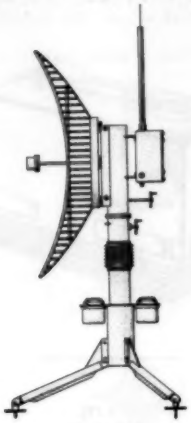
Filed Feb. 24, 1982, Ser. No. 351,796
Term of patent 14 years
U.S. Cl. D14—54

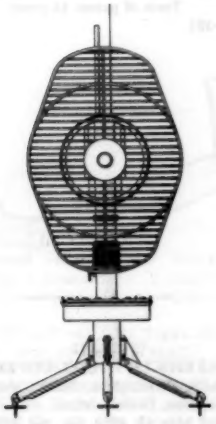
275,197

PORTABLE ANTENNA GROUND SCORING UNIT FOR AIR TO GROUND GUNNERY

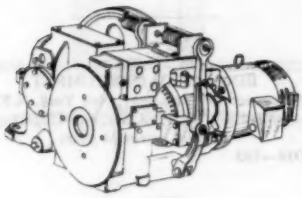
Hugh B. Feagle, Leeds, Ala., assignor to Hayes International Corporation, Birmingham, Ala.

Filed Mar. 8, 1982, Ser. No. 355,460
Term of patent 14 years
U.S. Cl. D14—86



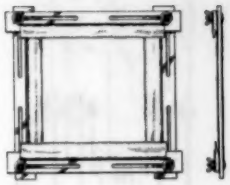


275,198
ELEVATOR HOISTING ENGINE
Satoru Yokota; Yasutaka Hirano, and Tamaiti Kondou, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyodaku, Japan
Division of Ser. No. 285,877, Jul. 23, 1981,. This application Sep. 16, 1983, Ser. No. 532,989
Claims priority, application Japan, Feb. 5, 1981, 56-4254; Feb. 5, 1981, 56-4256; Feb. 5, 1981, 56-4257; May 18, 1981, 56-21312; May 18, 1981, 56-21313; May 18, 1981, 56-21314; May 18, 1981, 56-21315
Term of patent 14 years
U.S. Cl. D15—1

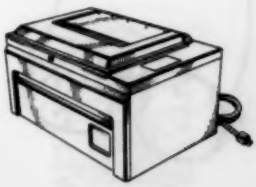


275,199
TRACTOR CAB
William M. Schmidt, St. Clair Shore; Robert Demick, East Detroit, and Stanley E. Thorwaldsen, Grosse Pointe Farms, all of Mich., assignors to Allis-Chalmers Corp., Milwaukee, Wis.
Filed Jan. 4, 1982, Ser. No. 336,865
Term of patent 14 years
U.S. Cl. D15—30

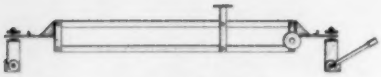
275,200
QUILT FRAME
Evelyn Langford, 517 S. Mariposa St., Los Angeles, Calif. 90020
Filed Feb. 12, 1982, Ser. No. 348,590
Term of patent 14 years
U.S. Cl. D15—66

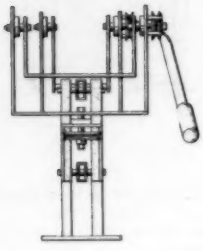


275,201
MICROFICHE DUPLICATOR
Claudia L. Taylor, Brooklyn Park, and Allen A. Lawson, Blaine, both of Minn., assignors to Colight, Inc., Minneapolis, Minn.
Filed Sep. 30, 1982, Ser. No. 431,136
Term of patent 14 years
U.S. Cl. D16—27



275,202
CAMERA BOOM OR THE LIKE
Eddie N. Barber, 1305 Pratt Ct., Raleigh, N.C. 27606
Filed Mar. 19, 1982, Ser. No. 359,691
Term of patent 14 years
U.S. Cl. D16—44



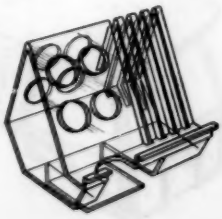


275,203
EYEGLASS FRAME
Robert M. Shyer, c/o Zyloware Corp., 11-36 46th Rd., Long Island City, N.Y. 11101
Filed Sep. 21, 1982, Ser. No. 420,724
Term of patent 14 years
U.S. Cl. D16—113

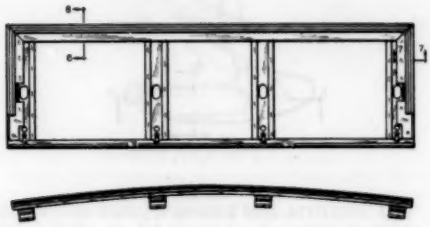
275,204
SPECTACLES
Joseph Kanoûi, Geneva, Switzerland, assignor to Interdica SA, Villars-Sur-Glane, Switzerland
Filed Nov. 6, 1981, Ser. No. 318,793
Claims priority, application Hague, May 8, 1981, 71414
Term of patent 14 years
U.S. Cl. D16—117

275,205
BINOCULAR INSTRUMENT
Ryoichi Nakayama, 299 Broadway, New York, N.Y. 10007
Filed Sep. 24, 1982, Ser. No. 422,861
Term of patent 14 years
U.S. Cl. D16—133

275,206
DRAFTING TOOL ORGANIZING DEVICE
Gordon D. Fineout, 2512 Delta River, Lansing, Mich. 48906
Filed Mar. 8, 1982, Ser. No. 356,130
Term of patent 14 years
U.S. Cl. D19—77



275,207
SIGN FRAME
Irving R. Yarder, Toledo, Ohio, assignor to Yarder Manufacturing, Toledo, Ohio
Filed Jan. 18, 1982, Ser. No. 340,189
Term of patent 14 years
U.S. Cl. D20—42



275,208
VIDEO GAME CABINET
David Nutting, Barrington Hills, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Feb. 22, 1982, Ser. No. 350,751
Term of patent 14 years
U.S. Cl. D21—13

275,209
VIDEO GAME CABINET
David Nutting, Barrington Hills, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Mar. 11, 1982, Ser. No. 356,969
Term of patent 14 years
U.S. Cl. D21—13

275,210
COMBINED MAZE ELECTRONIC GAME AND WATCH HOUSING
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Jun. 8, 1982, Ser. No. 386,411
Term of patent 14 years
U.S. Cl. D21—13

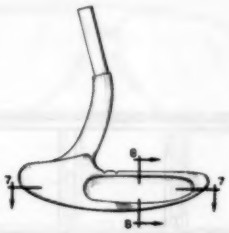
275,211
TOY BARN
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Jul. 19, 1982, Ser. No. 399,723
Term of patent 14 years
U.S. Cl. D21—116

275,212
WHEELED FIGURE TOY
Robert K. Allen, Cincinnati, Ohio; Charlotte A. Eicher, Fort Mitchell, Ky., and David Windslow, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jun. 7, 1982, Ser. No. 386,150
Term of patent 14 years
U.S. Cl. D21—185

275,213
PHYSICAL EXERCISER
Martin W. Johnson, R.R. #1, Box 95, Portland, N. Dak. 58274
Filed Jan. 4, 1982, Ser. No. 337,513
Term of patent 14 years
U.S. Cl. D21—191

275,214
GOLF PUTTER HEAD
Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254
Filed Aug. 23, 1982, Ser. No. 410,538
Term of patent 14 years
U.S. Cl. D21—219

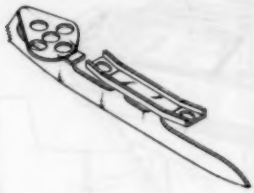
275,215
GOLF PUTTER HEAD
Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254
Filed Aug. 23, 1982, Ser. No. 410,540
Term of patent 14 years
U.S. Cl. D21—219



275,216
GOLF PUTTER HEAD
Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254
Filed Aug. 23, 1982, Ser. No. 410,615
Term of patent 14 years
U.S. Cl. D21—219

275,217
GOLF PUTTER HEAD
Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254
Filed Aug. 23, 1982, Ser. No. 410,616
Term of patent 14 years
U.S. Cl. D21—219

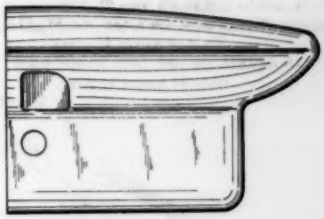
275,218
ICE-SKATE
Wen-Hwang Chang, 2nd Fl., No. 124-1, Chang-Chuen Rd., Taipei, Taiwan
Filed Jun. 30, 1981, Ser. No. 279,019
Claims priority, application Taiwan, Feb. 3, 1981, 7030372
Term of patent 14 years
U.S. Cl. D21—225



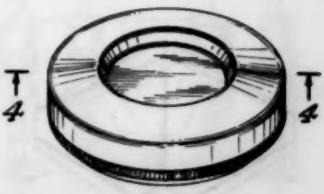
275,219
HAND AND WRIST SUPPORT FOR ATHLETIC USE
Robert E. Scales, Jr., 838 Garrett La., Springfield, Pa. 19064
Filed Jul. 8, 1982, Ser. No. 396,455
Term of patent 14 years
U.S. Cl. D21—234

275,220
GRILL FOR AN ELECTRONIC INSECT KILLER OR TRAP
Man H. Lee; Moon W. Lee; Ping N. Lin, and Kai C. Chan, all of 8/F, Sui On Industrial Building, 134 Wai Yip St., Kwun Tong, Kowloon, Hong Kong
Filed Feb. 17, 1982, Ser. No. 349,455
Claims priority, application United Kingdom, Aug. 19, 1981, 1002063
Term of patent 14 years
U.S. Cl. D22—19

275,221
BIDET
Axel Enthoven, Wijnegen, Belgium, assignor to American Standard Inc., New York, N.Y.
Filed Apr. 12, 1982, Ser. No. 367,322
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1981, 20 MR 1910
Term of patent 14 years
U.S. Cl. D23—51



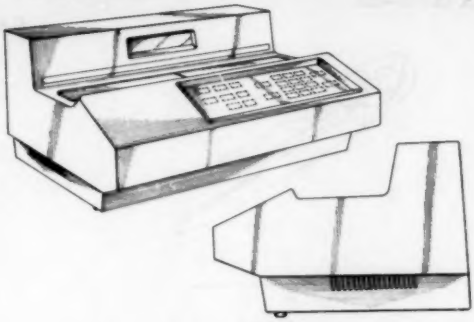
275,222
DISPENSER FOR AIR TREATING MATERIAL
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Apr. 19, 1982, Ser. No. 369,435
Term of patent 14 years
U.S. Cl. D23—150



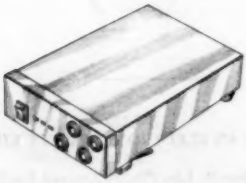
275,223
AIR FRESHENER
Marilyn Marxen, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed May 18, 1982, Ser. No. 379,391
Term of patent 14 years
U.S. Cl. D23—150

275,224
PERMANENT BRIQUETTE FOR GAS FIRED BARBEQUE GRILLS
Joseph M. Darché, Branford, Conn., assignor to Charmbrik & Stone, East Haven, Conn.
Filed Feb. 22, 1982, Ser. No. 351,004
Term of patent 14 years
U.S. Cl. D23—166

275,225
MEDICAL ANALYZER CABINET
Manfred Hegemann, South Nyack, N.Y., assignor to Electro-Nucleonics, Inc., Fairfield, N.J.
Filed Oct. 19, 1981, Ser. No. 312,683
Term of patent 14 years
U.S. Cl. D24—17



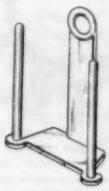
275,226
ENDOSCOPE HEATER
Shinichi Nishigaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1981, Ser. No. 329,113
Claims priority, application Japan, Jun. 11, 1981, 56/25647
Term of patent 14 years
U.S. Cl. D24—17



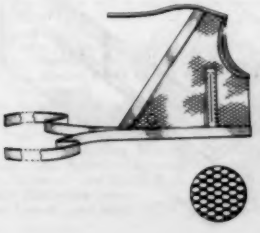
275,227
ARTHROSCOPIC SURGICAL RETRACTOR
James H. Garner, Jr., 10201 Howe Dr., Leawood, Kans. 66206
Filed Dec. 16, 1981, Ser. No. 331,136
Term of patent 14 years
U.S. Cl. D24—27

275,228
PIPE IN HEATER FOR HEATING ENDOSCOPE
Shinichi Nishigaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1981, Ser. No. 329,114
Claims priority, application Japan, Jun. 11, 1981, 56/25648
Term of patent 14 years
U.S. Cl. D24—29

275,229
SURGICAL INSTRUMENT HOLDER
Roger S. Sanderson, Dana Point, and Robert C. Whelchel, Newport Beach, both of Calif.
Filed Mar. 9, 1982, Ser. No. 356,383
Term of patent 14 years
U.S. Cl. D24—31

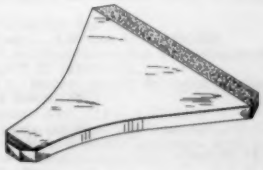


275,230
BODY RESTRAINER
Vance M. Hubbard, Euless, and Welton K. Brunson, Bedford, both of Tex.
Filed Sep. 5, 1980, Ser. No. 184,622
Term of patent 14 years
U.S. Cl. D24—34

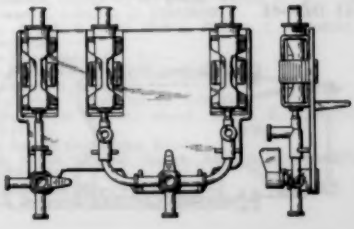


275,231
COMPRESSIBLE CLEFT PALATE NURSER
Ronald C. Fuller, Evansville, Ind.
Filed Jan. 15, 1982, Ser. No. 339,280
Term of patent 14 years
U.S. Cl. D24—47

275,232
SANITARY NAPKIN
Barbara J. Jones, 823 N. Patterson Park Ave., Baltimore, Md. 21205
Filed Nov. 6, 1981, Ser. No. 318,735
Term of patent 14 years
U.S. Cl. D24—51



275,233
MANIFOLD FOR A MEDICAL MONITORING UNIT
William A. DeVroom, Glendora, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 31, 1981, Ser. No. 297,653
Term of patent 14 years
U.S. Cl. D24—53

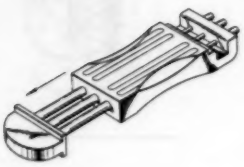


275,234

MICROBIOLOGICAL TESTING SYRINGE

Howard M. Chandler, Kangaroo Ground; Kevin Healey, Niddrie, and John G. R. Hurrell, Strathmore, all of Australia, assignors to Commonwealth Serum Laboratories Commission, Parkville, Australia

Filed Apr. 23, 1982, Ser. No. 371,048
Term of patent 14 years
U.S. Cl. D24—55

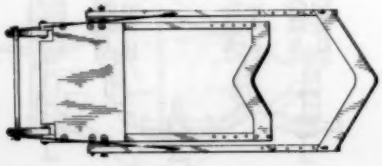


275,235

TREE CLIMBER SEAT OR THE LIKE

Alvin E. Warren, and George B. Sweat, both of Jacksonville, Fla., assignors to Warren & Sweat Manufacturing Company, Grand Island, Fla.

Filed May 17, 1982, Ser. No. 379,123
Term of patent 14 years
U.S. Cl. D25—62



275,236

BATH BRUSH FOR THE HANDICAPPED

Karl I. Soderback, Glantan, 710 23 Glanshammar, Sweden

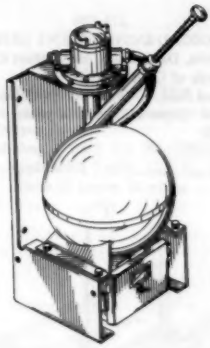
Filed Dec. 6, 1982, Ser. No. 447,251
Claims priority, application Sweden, Jun. 3, 1982, 82-1466
Term of patent 14 years
U.S. Cl. D28—63

275,237

COMBINED BATTERY OPERATED EXPLOSION DETECTION AND SUPPRESSION UNIT FOR INDUSTRIAL STORAGE ENCLOSURES

Joseph P. Gillis, Westboro, Mass., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Dec. 18, 1981, Ser. No. 332,083
Term of patent 14 years
U.S. Cl. D29—2

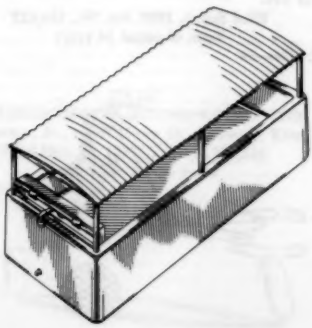


275,238

WATERING TROUGH FOR ANIMALS

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034

Filed Mar. 26, 1982, Ser. No. 362,078
Term of patent 14 years
U.S. Cl. D30—13



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF AUGUST, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See*—
Douthart, Robert H.; and Smith, Howard W., 4,467,257, Cl. 318-774.000.

Abbazia, Leonard P.: *See*—
Cifrese, Ralph; Medri, Mario W.; and Abbazia, Leonard P., 4,466,983, Cl. 426-5.000.

Abe, Masafumi, to Nissan Motor Company, Limited. Automotive vehicle cowl construction. 4,466,654, Cl. 296-192.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,467,464, Cl. 369-77.200.

Abrams, Robert M., to University of Florida. Systems and devices for measurement of urine temperature, particularly for detecting the shift in basal body temperature in women. 4,466,445, Cl. 128-736.000.

ACF Industries, Incorporated: *See*—
Dugge, Richard H.; and Rollins, Dallas W., 4,466,558, Cl. 222-195.000.
Messersmith, Robert C.; and Polley, Richard B., 4,466,356, Cl. 105-358.000.

Adam, Wilhelm: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Adam, Wilhelm, 4,467,056, Cl. 523-208.000.

Adams, Karl B.: *See*—
Tsen, Cho C.; and Adams, Karl B., 4,466,985, Cl. 426-131.000.

Adams, William V., to Durametallic Corporation. Mechanical seal assembly with integral pumping device. 4,466,619, Cl. 277-15.000.

Advanced Micro Devices, Inc.: *See*—
Harmon, William J., Jr.; and Mick, John R., 4,467,444, Cl. 364-900.000.

Aerovox Incorporated: *See*—
MacDougall, Frederick W., 4,467,392, Cl. 361-275.000.

Agency of Industrial Science and Technology: *See*—
Matsuda, Kiyofumi; Tenjinbayashi, Koji; and Kohno, Tsuguo, 4,466,693, Cl. 350-3.600.

Ager, Verkuilen B., to Itek Corporation. Method of enhancing the production of typeset runarounds. 4,466,192, Cl. 33-1.00B.

Agfa-Gevaert AG: *See*—
Lermann, Peter; Cocron, Istvan; and Fauth, Gunter, 4,466,718, Cl. 354-408.000.
Nitsch, Wilhelm; and Nagel, Erich, 4,466,579, Cl. 242-67.10R.

Aggio, Giordano. Method for producing etched patterns on textile fabrics. 4,466,860, Cl. 156-655.000.

Aikman, Leslie N. Tobacco smoke filter. 4,466,448, Cl. 131-216.000.

Air Products and Chemicals, Inc.: *See*—
Bechara, Ibrahim S., 4,467,089, Cl. 544-351.000.

Aishin Seiki Kabushiki Kaisha: *See*—
Oishi, Yaichi; Maruyama, Katsuaki; Takano, Kenji; Terada, Takami; and Hyodo, Motoi, 4,466,663, Cl. 297-410.000.

Aisin Seiki Kabushikaisha: *See*—
Kondo, Kouichi; Ueda, Masahiro; and Nonoyama, Seiji, 4,466,625, Cl. 280-6.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Furuta, Youichi; Tsubouchi, Kaoru; Nishii, Michiharu; Sugiura, Yuzuru; and Tsuchida, Shozaburo, 4,466,246, Cl. 60-547.100.
Hida, Takashi; Takayama, Katsuki; and Kuwana, Kazutaka, 4,467,426, Cl. 364-424.000.
Oguma, Tomio, 4,466,312, Cl. 74-868.000.
Takeshita, Hiroshi; Chuwman, Tsutomu; and Yamamoto, Susumu, 4,466,673, Cl. 303-22.00R.

Aisslinger, Dieter E.: *See*—
Pusch, Gunter; Weimar, Reinhold; and Aisslinger, Dieter E., 4,467,005, Cl. 428-111.000.

Ajioka, James S.; and Tang, Raymond, to Hughes Aircraft Company. Millimeter-wave phase shifting device. 4,467,292, Cl. 333-24.100.

Akagi, Mikiya; Nishimura, Hiroyuki; and Nishimura, Hideki, to Nippon Electric Co., Ltd. Cashe memory arrangement comprising a cashe buffer in combination with a pair of cache memories. 4,467,414, Cl. 364-200.000.

Akagi, Toshimasa: *See*—
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, 4,467,361, Cl. 358-213.000.

Akatsuka, Takao: *See*—
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,466,392, Cl. 123-179.00G.

Akiyama, Toshiyuki: *See*—
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.

Aktiebolaget Electrolux: *See*—
Moren, Lars G.; and Berg, Ulf P., 4,467,233, Cl. 310-162.000.

Akutsu, Eiichi, to Ricoh Company, Ltd. Process for regenerating ink sheet. 4,467,332, Cl. 346-140.00R.

Akzona Incorporated: *See*—
Frank, Dieter; and Metcalfe, Lincoln D., 4,466,840, Cl. 148-6.14R.
Zengel, Hans; and Bergfeld, Manfred, 4,467,114, Cl. 564-57.000.

Albany International Corp.: *See*—
Bolton, Joseph A.; and Duncan, Jeffrey B., 4,466,873, Cl. 162-198.000.
Coplan, Myron J.; and Burchesky, Robert D., 4,467,001, Cl. 427-434.600.

Alberico, Dominec; and Albert, Jack A. Aerial flight device. 4,466,213, Cl. 446-56.000.

Albert, Jack A.: *See*—
Alberico, Dominec; and Albert, Jack A., 4,466,213, Cl. 446-56.000.

Albert, James W.: *See*—
Nayler, Douglas W. J.; Gilson, Gerald W.; Tilker, Fred C.; and Albert, James W., 4,466,488, Cl. 166-355.000.

Albiez, Peter. Animal feces pick-up device. 4,466,648, Cl. 294-1.0BA.

Ali, Rafath; and Vaughn, Thomas D., to Intertherm Inc. Portable electric baseboard heater having an integral handle. 4,467,179, Cl. 219-368.000.

Allardt, Hans-Dieter: *See*—
Walters, Reiner; Moschl, Gernot; and Allardt, Hans-Dieter, 4,466,805, Cl. 8-406.000.

Allemano, Emilio. Underwater instrument for the combined reading of immersion time and depth, and decompression time. 4,466,285, Cl. 73-432.00R.

Allen Engineering Corporation: *See*—
Allen, J. Dewayne, 4,466,757, Cl. 404-114.000.

Allen Group, Inc.: *See*—
May, Richard L., 4,467,403, Cl. 362-250.000.

Allen, J. Dewayne, to Allen Engineering Corporation. Vibratory screed including a spreading device for leveling and distributing plastic concrete in front of the screed. 4,466,757, Cl. 404-114.000.

Allis-Chalmers Corporation: *See*—
Berg, David A., 4,466,631, Cl. 280-415.00A.
Hanaway, Roger D., 4,466,549, Cl. 220-4.00A.
Hoefer, Wayne A.; and Busboom, Garry W., 4,466,447, Cl. 130-27.00F.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,467,016, Cl. 428-595.000.

Alofs, Wayne J., to Prince Corporation. Die casting machine with strain gauge. 4,466,477, Cl. 164-150.000.

Alonzo, Peter L. Bracket element for supporting hanging devices. 4,466,591, Cl. 248-217.100.

Alsthom-Atlantique: *See*—
Nicoloso, Dante; and Pham Van, Doan, 4,467,157, Cl. 200-148.00F.

Alston, Lawrence E., to Polaroid Corporation. Apparatus for exposing photosensitive material to video frame. 4,467,369, Cl. 358-332.000.

Alt, Gerhard H.: *See*—
Chupp, John P.; and Alt, Gerhard H., 4,467,125, Cl. 568-936.000.

Altherr, Russell G.; and Kaim, John W., to AMSTED Industries Incorporated. Bottom shelf coupler with anticreep protection means. 4,466,546, Cl. 213-148.000.

Aluminum Company of America: *See*—
Booz, A. David; Buchovecky, Kalman E.; Cebulak, Walter S.; Kuchera, Ray A.; and White, David D., Jr., 4,466,786, Cl. 425-7.000.

Amada Company Limited: *See*—
Ikeda, Nobuyuki, 4,466,317, Cl. 83-55.000.

American Crystal Sugar Company: *See*—
Kysilka, James O.; and Sawicki, Charles A., 4,467,204, Cl. 250-343.000.

American Home Products Corporation: *See*—
Hjorth, Richard N.; Moore, Bobby O.; and Grant, Norman H., 4,466,957, Cl. 424-89.000.

American Hospital Supply Corporation: *See*—
Butterworth, George A. M.; Evans, William M.; and Goldner, Howard J., 4,466,552, Cl. 220-354.000.
Stout, David M.; and Matier, William L., 4,466,965, Cl. 424-250.000.

American Microsystems, Inc.: *See*—
Batra, Tarsaim L., 4,466,172, Cl. 29-571.000.

American Standard Inc.: *See*—
Briner, Clifton F., 4,466,340, Cl. 98-60.000.
McElroy, John M.; and Janney, Charles E., 4,467,270, Cl. 324-51.000.

American Sunroof Corporation: *See*—
Kaltz, Milton C.; and Trotter, Richard H., 4,466,657, Cl. 296-221.000.

AMF Incorporated: *See*—
Rulseh, Roger D., 4,466,310, Cl. 74-665.0GA.

Wilkerson, Timothy M.; and Learned, Edward B., 4,467,144, Cl. 179-84.00R.
Amikura, Takashi: *See*—
Tsunekawa, Tokuichi; and Amikura, Takashi, 4,467,187, Cl. 250-204.000.
AMP Incorporated: *See*—
Frantz, Robert H., 4,466,687, Cl. 339-198.00H.
Ampex Corporation: *See*—
Witt, William F., 4,466,512, Cl. 188-171.000.
AMSTED Industries Incorporated: *See*—
Altherr, Russell G.; and Kaim, John W., 4,466,546, Cl. 213-148.000.
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Ando, Nobuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Gas/vapor cooled electromagnetic induction machine. 4,467,305, Cl. 336-55.000.
Andreev, Anatoly A.; Gavrilov, Alexei G.; Galitskaya, Galina K.; Zhed, Viktor P.; Sinelschikov, Andrei K.; Padalka, Valentin G.; and Tolok, Vladimir T., to Vsesojuzny Nauchno-Issledovatelsky Instrumentalny Institut. Cutting tool hardening method. 4,466,991, Cl. 427-38.000.
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Bugaut, Andree; and Andrillon, Patrick, 4,466,806, Cl. 8-414.000.
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Carnaghi, Arturo S., 4,466,137, Cl. 2-237.000.
Angelini, Peter: *See*—
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Angle, Richard O.: *See*—
Ferguson, John H., Jr.; and Angle, Richard O., 4,466,321, Cl. 83-435.100.
Angleboard Inc.: *See*—
Liebel, Henry L., 4,467,004, Cl. 428-81.000.
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Basile, Peter A.; Annese, Clara Ann; and Colwell, Dennis J., 4,466,342, Cl. 99-323.100.
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Antonini, Joseph; and Zawodni, Frank W., to Dana Corporation. Steering ball seal. 4,466,623, Cl. 277-153.000.
Anzai, Masayasu, to Hitachi, Ltd. Laser beam printer. 4,467,334, Cl. 346-160.000.
Aoki, Kenzo, to Fuji Jukogyo Kabushiki Kaisha. System for correcting the effect of altitude on a turbocharged internal combustion engine. 4,466,247, Cl. 60-602.000.
Aoyagi, Edward I., to Chevron Research Company. Insecticidal 1-alkyl-5-substituted-4-chloropyrazole-3-yl-(thio) phosphates and (thio) phosphonates. 4,466,962, Cl. 424-200.000.
Apel, Thomas R., to Rockwell International Corporation. Ferrite type directional coupler. 4,467,293, Cl. 333-112.000.
Appel, Peter W.; Den Outer, Robert D.; Schutter, Klaas; and Broekhoff, Johan C. P., to Lever Brothers Company. Process for the manufacture of soap powder. 4,466,897, Cl. 252-108.000.
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Hata, Seiji; Terabayashi, Takao; Arakawa, Noriyoshi; and Watanabe, Makoto, 4,467,170, Cl. 219-121.0EH.
Araki, Shigeru: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.
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Strickland, Leon; Foglesong, Robert M.; and Arden, Terry D., 4,466,209, Cl. 42-90.000.
Argiro, Jason. Cuboid block, instructional device for multiplication tables. 4,466,799, Cl. 434-203.000.
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Arkus-Duntov, Zora, to Colt Industries Operating Corp. Intake-manifold. 4,466,389, Cl. 123-52.0MB.
Arnold, James J.: *See*—
Bottom, James T.; Arnold, James J.; and Thompson, Francis P., 4,466,136, Cl. 2-115.000.
Arnon, Ephraim; Chomik, Michael W.; and Barlow, Christopher J., to Northern Telecom Limited. Time compression multiplex digital transmission system. 4,467,473, Cl. 370-100.000.
Arold, Frank G. Power plant having a fluid powered flywheel. 4,466,245, Cl. 60-415.000.
Aronowitz, Robert; and Katzanek, Bernard. Chair having adjsutable, cantilevered lumbar-supporting arm. 4,466,665, Cl. 297-418.000.
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Valayil, Silvester P.; and Aronson, Vita, 4,467,067, Cl. 524-435.000.
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Hamada, Masato; Ohmura, Jukichi; and Muranaka, Fumio, 4,466,881, Cl. 204-59.00F.
Asaka, Urataro; Nakano, Teruyuki; Miyazawa, Shinkichi; and Masuda, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Secondary air introducing apparatus for internal combustion engine. 4,466,409, Cl. 123-433.000.
Asami, Shinichi; Sakamoto, Hiroshi; and Inaba, Norihiko, to Ricoh Company, Ltd. Thermosensitive recording material. 4,467,339, Cl. 346-214.000.
Asano, Katsuhiro; and Iwama, Norio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Multi-level inverter. 4,467,407, Cl. 363-43.000.
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Iwahashi, Hiroshi; and Asano, Masamichi, 4,467,457, Cl. 365-228.000.
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Bandoli, Fulvio; and Chiarelli, Edoardo, 4,467,385, Cl. 361-24.000.
Associated Engineering Limited: *See*—
Caldwell, Kenneth B., 4,467,428, Cl. 364-426.000.
Astle, William H., to Tri Tool, Inc. Precision scriber for tubular work-pieces. 4,466,193, Cl. 33-21.00R.
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Davis, Dean I.; Ensz, Lyndon D.; and Grubelich, Matthew J., 4,466,689, Cl. 339-263.00R.
Gritton, Charles W. K., 4,467,441, Cl. 364-724.000.
Miller, Stewart E., 4,467,468, Cl. 370-3.000.
Rubin, Harvey, 4,467,147, Cl. 179-175.20C.
Sheets, Laurence L., 4,467,149, Cl. 179-175.230.
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Chang, Gee-Kung; Hartman, Adrian R.; and Weston, Harry T., 4,467,344, Cl. 357-39.000.
AT&T Technologies, Inc.: *See*—
Bacon, Duane E.; and Hecox, Spencer S., 4,466,864, Cl. 204-15.000.
Beltz, Richard K.; Large, Donald M.; and Leffel, Daniel D., 4,466,852, Cl. 156-344.000.
Davis, Dean I.; Ensz, Lyndon D.; and Grubelich, Matthew J., 4,466,689, Cl. 339-263.00R.
Einbinder, Itamar B., 4,466,872, Cl. 204-192.00R.
Haller, Albert H.; and Schutz, Eckart F., 4,466,989, Cl. 427-185.000.
Jacobs, Brian E.; and March, Edward J., 4,466,791, Cl. 432-23.000.
Atari, Inc.: *See*—
Hoff, Morgan P., 4,467,412, Cl. 364-200.000.
Athanassiu, Christos; and St. Laurent, Wilfred H., Jr., to Bellofram Corporation. Rolling diaphragm vacuum control with check valve. 4,466,455, Cl. 137-116.500.
Atlanta Attachment Company: *See*—
Price, Elvin C.; Young, James R.; and Bottoms, Joseph A., 4,466,367, Cl. 112-134.000.
Atlantic Richfield Company: *See*—
Eickemeyer, Daniel B.; Rausch, Maurice K.; and Tollefsen, Gerald E., 4,466,883, Cl. 208-50.000.
Go, Ting S. L.; and Wilson, George R., III, 4,467,132, Cl. 585-724.000.
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Brun, Claude; and Pelletier, Robert, 4,467,080, Cl. 526-62.000.
Audeh, Costandi A.; Dickert, Joseph J., Jr.; and Fowles, Patrick E., to Mobil Oil Corporation. Simultaneous beneficiation and treatment of oil shale. 4,466,882, Cl. 208-11.00R.
Aures, Reinhard; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, to Robert Bosch GmbH. Ignition pulse and crankshaft angle pulse generator and distributor combination. 4,466,407, Cl. 123-425.000.
Autoclave Engineers, Inc.: *See*—
Ruyak, Robert F.; Ratkowski, Stephen G.; Ciprich, Samuel D.; and Silver, Theodore R., 4,466,276, Cl. 73-59.000.
Automated Packaging Systems, Inc.: *See*—
Lerner, Hershey; and Waitz, Harold, 4,467,207, Cl. 250-459.100.
Avritt, Michael D.; and Farrow, Michael M., to International Business Machines Corporation. Plasticizer removal process and system. 4,466,813, Cl. 55-74.000.
Ayata, Naoki: *See*—
Fujii, Motoharu; Koumura, Noboru; Sato, Yasushi; Ayata, Naoki; and Saito, Seiji, 4,467,348, Cl. 358-78.000.
Ayers, William, to Energy Conversion Devices, Inc. Photolytic production of hydrogen. 4,466,869, Cl. 204-157.10R.
Aylward, Joseph R., to DBX, Inc. Signal expander. 4,467,287, Cl. 330-126.000.
B. F. Goodrich Company, The: *See*—
Hsu, Chin C.; and Goscewski, Stanley R., 4,466,993, Cl. 427-44.000.
Kolycheck, Edmond G.; and Tolle, Laura L., 4,467,078, Cl. 525-455.000.
Kroenke, William J.; and Nicholas, Paul P., 4,467,127, Cl. 570-224.000.
Lai, John T., 4,466,915, Cl. 260-239.30R.
Lai, John T.; and Son, Pyong N., 4,466,916, Cl. 260-239.30R.
Lee, Biing-Lin, 4,467,060, Cl. 523-353.000.
Baba, Kazuo, to Olympus Optical Co., Ltd. Ultrasonic diagnostic apparatus. 4,466,444, Cl. 128-660.000.

Baba, Shigeyuki; and Toda, Tadayoshi, to Nissan Motor Company, Limited. Headlining arrangement. 4,466,655, Cl. 296-214.000.
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Babbitt, Ora H.; and Babbitt, Garvin G., 4,466,382, Cl. 119-52.00R.
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Babcock & Wilcox Company, The: *See*—
Keyes, Marion A., IV, 4,466,296, Cl. 73-862.520.
Klatt, John H.; and Matsko, Theodore N., 4,466,383, Cl. 122-379.000.
Babitzka, Rudolf; Polach, Wilhelm; and Schlagmuller, Walter, to Robert Bosch GmbH. Electro-hydraulic valve control system for internal combustion engine valves. 4,466,390, Cl. 123-90.160.
Bachman, Gilbert; and Weaver, Gabriel H., to Dittler Brothers, Inc. Game with selectable playing areas. 4,466,614, Cl. 273-139.000.
Bachman, John A., to Del Mar Avionics. Apparatus and method for printing annotated electrocardial data. 4,467,324, Cl. 340-722.000.
Bacon, Duane E.; and Hecox, Spencer S., to AT&T Technologies, Inc. Methods of and apparatus for electroplating preselected surface regions of electrical articles. 4,466,864, Cl. 204-15.000.
Baidwan, Balinderjeet S.; and Iwasaki, Dean H., to Marquest Medical Products, Inc. Plunger subassembly for blood gas syringes. 4,466,446, Cl. 128-765.000.
Baier, Robert E.; King, Raymond W.; and Meyer, Anne E., to Calspan Corporation. Thermal chambered flow cell. 4,466,277, Cl. 73-61.200.
Bair, Thomas I.; and Gulrich, Leslie W., Jr., to Du Pont de Nemours, E. I., and Company. Aramid spinning process. 4,466,935, Cl. 264-184.000.
Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Aluminized chromized steel. 4,467,016, Cl. 428-595.000.
Baldini, Luciano: *See*—
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,467,003, Cl. 428-64.000.
Baldwin, A. Frank, to Burlington Industries, Inc. Bioactive water and alcohol-repellant medical fabric. 4,467,013, Cl. 428-289.000.
Baliga, Bantval J., to General Electric Company. Methods for fabricating vertical channel buried grid field controlled devices including field effect transistors and field controlled thyristors utilizing etch and refill techniques. 4,466,173, Cl. 29-571.000.
Ballabene, Corrado; and Dotsch, Horst, to Italimpianti Societa Italiana Impianti P.A. Walking beam furnace. 4,466,792, Cl. 432-122.000.
Ballard, Albert S.: *See*—
Kramer, Milo G.; Ballard, Albert S.; and Kramer, Gideon A., 4,466,716, Cl. 353-94.000.
Ballarini, Ottavio, to Fiat Auto S.p.A. Modular strip fuse carrier assembly. 4,466,683, Cl. 339-125.00R.
Balliet, Layton; Coffman, Donald H.; and Gomez, Carlos, to International Business Machines Corporation. Single fiber optic wand system. 4,467,196, Cl. 250-227.000.
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Band, Elliot I., to Stauffer Chemical Company. Supported catalyst for polymerization of olefins. 4,467,044, Cl. 502-111.000.
Bandoli, Fulvio; and Chiarelli, Edoardo, to Aspera S.p.A. Supply and protection unit for a hermetic compressor. 4,467,385, Cl. 361-24.000.
Bannai, Kiyoshi: *See*—
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Bansal, Anil: *See*—
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Barch, Herbert W.; Martin, Emil; and Greer, S. Thomas, to PPG Industries, Inc. Applicator for applying a coating to a surface. 4,466,151, Cl. 15-209.00D.
Bardwell, Allen E. Detachable shoe plates for large diameter drill bits. 4,466,498, Cl. 175-410.000.
Barlow, Christopher J.: *See*—
Arnon, Ephraim; Chomik, Michael W.; and Barlow, Christopher J., 4,467,473, Cl. 370-100.000.
Barnard, Michael A.: *See*—
Beugelsdyk, Anthony F.; and Barnard, Michael A., 4,466,232, Cl. 56-10.800.
Barnwell, Robert; and Frye, David R., to Plasti-Pak. Tray for packaging food products. 4,467,052, Cl. 521-92.000.
Bartlett, Norman C. Cylinder construction for a printing press. 4,466,349, Cl. 101-220.000.
Barzen, Thomas J., to GTE Automatic Electric Inc. Start-up circuit for negative inductance multiplier. 4,467,269, Cl. 323-356.000.
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Ditter, Walter; Etzbach, Karl-Heinz; Horn, Dieter; Patsch, Manfred; and Eilingsfeld, Heinz, 4,466,899, Cl. 252-299.100.
Fischer, Rolf; and Weitz, Hans-Martin, 4,467,120, Cl. 568-484.000.
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.
Weitz, Hans-Martin; and Fischer, Rolf, 4,466,922, Cl. 260-410.90R.
Basile, Peter A.; Annese, Clara Ann; and Colwell, Dennis J., to General Foods Corporation. Carbonation chamber with sparger for beverage carbonation. 4,466,342, Cl. 99-323.100.
Batey, Robert M.; and Petroski, Peter J., to Hewlett Packard Company. Method and means for direct-current polarity restoration in magnetic recording. 4,467,374, Cl. 360-46.000.
Batra, Tarsaim L., to American Microsystems, Inc. Method for fabricating MOS device with self-aligned contacts. 4,466,172, Cl. 29-571.000.
Batteux, Pierre, to Merlin Gerin. Connecting terminal for circuit interrupter. 4,466,691, Cl. 339-272.00R.
Bauer, Gunter: *See*—
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Bauer, Karlheinz; Langenbeck, Andreas; Pfeiffer, Peter; and Tomforde, Johann, to Daimler-Benz AG. Vehicle lock illuminating system. 4,467,402, Cl. 362-32.000.
Baugher, Robert C.; Kiemer, Ralph F.; and Smith, Raymond R., Jr., to Steelastic Company, The. Apparatus for making elastomeric fabric. 4,466,531, Cl. 198-486.000.
Baum, Burton M.: *See*—
Treves, Gino R.; and Baum, Burton M., 4,467,095, Cl. 546-342.000.
Baumgartner Papiers S.A.: *See*—
Bonnet, Jacques; Jaccard, Pierre; and Veluz, Serge, 4,466,451, Cl. 131-335.000.
Baxter Travenol Laboratories, Inc.: *See*—
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Bayer Aktiengesellschaft: *See*—
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, 4,467,099, Cl. 548-264.000.
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,466,964, Cl. 424-246.000.
Mayer, Dietmar; Kramer, Horst-Dieter; Gabel, Eike; and Kohler, Wilfried, 4,467,123, Cl. 568-730.000.
Schapel, Dieter, 4,466,936, Cl. 264-225.000.
BBC Brown, Boveri & Company, Limited: *See*—
Frutschi, Hansulrich, 4,466,249, Cl. 60-648.000.
Koppl. Georg, 4,467,221, Cl. 307-112.000.
Beall, George H.; and Megles, John E., Jr., to Corning Glass Works. Potassium fluorrichterite glass ceramics and method. 4,467,039, Cl. 501-3.000.
Bear Automotive Service Equipment Company: *See*—
Kling, Michael J.; and Marino, Joseph A., 4,467,323, Cl. 340-721.000.
Bechara, Ibrahim S., to Air Products and Chemicals, Inc. Carbamate and carbonate salts of tertiary amines. 4,467,089, Cl. 544-351.000.
Bechmann, Gunter: *See*—
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Beckman Instruments, Inc.: *See*—
Farren, Carl A., 4,467,213, Cl. 250-504.00R.
Warnke, Dale F.; and Cederstrand, Carl N., 4,467,435, Cl. 364-497.000.
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Williams, Joel; Dunn, Terry; and Stannett, Vivian, 4,467,065, Cl. 524-296.000.
Beisswenger, Siegfried; and Boppel, Wolfgang, to Dr. Ing. Rudolf Hill GmbH. Highly-steady beam generating for charged particles. 4,467,205, Cl. 250-397.000.
Belbel, Elie; Fechant, Louis; Haury, Andre ; Lauraire, Michel; and Siffroi, Lucien, to La Telemecanique Electrique. Automatic short-circuit current limiting device. 4,467,298, Cl. 335-16.000.
Belke, Robert E., Jr.; Hill, Richard J.; Shirk, Raymond A.; and Smith, David P., to General Electric Company. Method of electroding a poly(vinylidene fluoride) solid. 4,466,874, Cl. 204-192.0EC.
Belko, Robert P.: *See*—
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Bell, Lon E., to Technar Incorporated. Thermal switch-operated glow plug control device for diesel engines. 4,466,393, Cl. 123-179.00H.
Bell, Wayne D.; and McFarland, Thomas K., to Sperry Corporation. Digital shade control for color CRT background and cursors. 4,467,322, Cl. 340-701.000.
Bellofram Corporation: *See*—
Athanassiu, Christos; and St. Laurent, Wilfred H., Jr., 4,466,455, Cl. 137-116.500.
Beltrop, Herbert; and Teutenberg, Josef, to Krupp Polysius AG. Pneumatic-tube conveying installation for samples of fine material. 4,466,761, Cl. 406-74.000.
Beltz, Richard K.; Large, Donald M.; and Leffel, Daniel D., to AT&T Technologies, Inc. Method and apparatus for demounting wafers. 4,466,852, Cl. 156-344.000.
Bend Research, Inc.: *See*—
Merten, Ulrich, 4,466,202, Cl. 34-27.000.
Bendix Corporation, The: *See*—
McPhee, Walter J., 4,467,320, Cl. 340-347.0SY.
Bendix Corporation, Flight Sys. Div., The: *See*—
Remus, Casimer F., 4,466,278, Cl. 73-115.000.
Bendix Limited: *See*—
Maddrick, Bernard D., 4,466,672, Cl. 303-22.00R.
Benignus, Douglas M.: *See*—
Mueller, Mark W.; Parker, Thomas S.; Benignus, Douglas M.; and Frye, James L., 4,467,445, Cl. 364-900.000.
Bennington, James E.; Boerma, Michael J.; Brakora, Anthony J.; Locker, Donald H.; and Rhoades, Terence J., to EDI. Transient driving cycle simulator test system. 4,466,294, Cl. 73-862.130.
Berbee, Hubertus J.; Voute, Hendrik J.; and Thijssen, Johannes M., to N.V. Optische Industrie "de Oude Delft". Scanner for scanning an object by means of ultrasonic radiation. 4,466,286, Cl. 73-629.000.

Berg, David A., to Allis-Chalmers Corporation. Ball joint assembly for draft arm. 4,466,631, Cl. 280-415.00A.

Berg, Jan: *See*—
Verbeek, Francois; Bulten, Eric J.; and Berg, Jan, 4,466,924, Cl. 260-429.00R.

Berg, Ulf P.: *See*—
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Bergemann, Uwe: *See*—
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Kissel, Rolande; Berger, Pierre; and Chrysostome, Gerard, 4,466,809, Cl. 48-197.00R.

Bergfeld, Manfred: *See*—
Zengel, Hans; and Bergfeld, Manfred, 4,467,114, Cl. 564-57.000.

Bergh, Daniel D.; Koch, Robert E.; and Timoshenko, John A., to General Electric Company. Combination strut insulator and lightning arrester. 4,467,387, Cl. 361-132.000.

Bernstein, Joel E., to Dermall, Ltd. Method for prophylaxis or treatment of emesis and nausea. 4,466,968, Cl. 424-260.000.

Besam AB: *See*—
Jonsson, Bert O., 4,467,251, Cl. 318-480.000.

Betensky, Ellis I., to Vivitar Corporation. Zoom lens. 4,466,708, Cl. 350-427.000.

Beugelsdyk, Anthony F.; and Barnard, Michael A., to Conchemco, Incorporated. Lawnmower control assembly. 4,466,232, Cl. 56-10.800.

Bickel, Paul: *See*—
Hanacek, William A.; and Bickel, Paul, 4,466,554, Cl. 221-1.000.

Bieffe S.P.A.: *See*—
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,467,003, Cl. 428-64.000.

Bielecki, John M.: *See*—
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bielomatik Leuze GmbH + Co.: *See*—
Schnell, Gerhard, 4,466,603, Cl. 270-58.000.

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Biglino, Renato, to Polymotor Italiana S.p.A. Permanent-magnet d.c. electric motor with resilient stator yoke. 4,467,231, Cl. 310-154.000.

Billet, Rene , to Valeo. Clutch release bearings. 4,466,527, Cl. 192-98.000.

Billings, Lawrence L.: *See*—
De Carolis, Joseph P.; and Billings, Lawrence L., 4,466,523, Cl. 192-43.100.

Biokinetics, Inc.: *See*—
Reese, John W., 4,466,613, Cl. 272-142.000.

Biosafety Systems, Inc.: *See*—
Gianni, Richard F., 4,466,538, Cl. 206-366.000.

Birr, Christian; and Stollenwerk, Ulrich, to Max-Planck Gesellschaft Zur Forderung Der Wissenschaften E.V. Method of preparing thymosin alpha 1 and derivatives thereof. 4,466,918, Cl. 260-112.50R.

Biswas, Chandi P., to Ingersoll-Rand Company. Clearance-controlling means comprising abradable layer and abrasive layer. 4,466,785, Cl. 418-152.000.

Bizot, Jean; and Deprez, Dominique, to Rhone-Poulenc Sante. Electrochemical process for the preparation of sulphoxides of thioformamide derivatives, which are useful as medicaments. 4,466,866, Cl. 204-78.000.

Blackburn, Anthony; and Readhead, John B., to U.S. Philips Corporation. Imaging devices and systems. 4,467,201, Cl. 250-334.000.

Blackman, Seymour N. Syringe with actinic ray blocking stripe. 4,466,426, Cl. 128-1.100.

Blake, Charles R.; and Mullersman, Ferdinand H., to General Electric Company. Battery charger with visual charge indicating means. 4,467,264, Cl. 320-2.000.

Blehert, Michael L., to Tennant Company. Air velocity control mechanism for selective debris pickup. 4,466,156, Cl. 15-346.000.

Bloomer, Milton D.; and Martzloff, Francois D., to General Electric Company. Current-limited spark gap for transient protection. 4,467,245, Cl. 315-75.000.

Bobick, Thomas W.; Clark, Frederic L.; and Paranjpe, Suresh C., to Mead Corporation, The. Ink drop duplicating system. 4,467,366, Cl. 358-296.000.

Bobst SA: *See*—
Schoch, Gregor, 4,466,318, Cl. 83-62.000.

Bock, Erich: *See*—
Siebert, Rainer; and Bock, Erich, 4,467,401, Cl. 361-427.000.

Boehringer Mannheim GmbH: *See*—
Kleinhammer, Gerd; Deutsch, Gerlinde; Linke, Hans-Ralf; Stahler, Fritz; and Gruber, Wolfgang, 4,467,030, Cl. 435-7.000.

Boeing Company, The: *See*—
Burnham, Robert W., 4,466,586, Cl. 244-75.00R.
Drake, Douglas C.; Wismer, Kenneth L.; and Ulrich, Henry D., 4,467,327, Cl. 343-17.700.

Boerma, Michael J.: *See*—
Bennington, James E.; Boerma, Michael J.; Brakora, Anthony J.; Locker, Donald H.; and Rhoades, Terence J., 4,466,294, Cl. 73-862.130.

Boettcher, Irmgard: *See*—
Klose, Walter; and Boettcher, Irmgard, 4,466,976, Cl. 424-273.00R.

Boichot-Castagne, Bernard; Case, Roger; and Pezelet, Jackie, to Merlin Gerin. Multi-pole circuit breaker with interchangeable magneto-thermal tripping unit. 4,467,297, Cl. 335-8.000.

Bollert, Volker: *See*—
Heeb, Dieter; Bechmann, Gunter; Bergemann, Uwe; Bollert, Volker; and Frenzel, Claus-Dieter, 4,466,838, Cl. 106-311.000.

Bolton, Joseph A.; and Duncan, Jeffrey B., to Albany International Corp. Vacuum dual control system for the flat box section of a papermaking machine. 4,466,873, Cl. 162-198.000.

Bonitz, Jorg: *See*—
Aures, Reinhard; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,466,407, Cl. 123-425.000.

Bonnet, Jacques; Jaccard, Pierre; and Veluz, Serge, to Baumgartner Papiers S.A. Method for aromatizing tobacco smoke. 4,466,451, Cl. 131-335.000.

Bonnie, G. Patrick: *See*—
Johnson, Robert J.; Miller, Charles N.; and Bonnie, G. Patrick, 4,467,151, Cl. 200-5.00A.

Booz, A. David; Buchovecky, Kalman E.; Cebulak, Walter S.; Kuchera, Ray A.; and White, David D., Jr., to Aluminum Company of America. Apparatus for production of atomized powder. 4,466,786, Cl. 425-7.000.

Boppel, Wolfgang: *See*—
Beisswenger, Siegfried; and Boppel, Wolfgang, 4,467,205, Cl. 250-397.000.

Boram, Frank. Hand tools for dispensing particulate matter. 4,466,560, Cl. 222-196.000.

Boring, Earl: *See*—
Moss, Theron C.; Boring, Earl; and Tomm, Irwin, 4,466,152, Cl. 15-229.00A.

Borne, Andre : *See*—
Jusseau, Marcel; Borne, Andre ; Fermond, Gilbert; and Heng, Jean P., 4,466,682, Cl. 339-97.00R.

Borstel, Heinz-Dieter, to Siemens Aktiengesellschaft. Hearing aid. 4,467,145, Cl. 179-107.00R.

Bos, Arnoldus J. B. M., to International Chemical Engineering Establishment. Method of processing elongated tubular material and device for performing said method. 4,466,157, Cl. 17-49.000.

Boschetto, Benjamen J., Jr.; and White, Timothy T. Combination tool including spanner wrench and screwdriver. 4,466,315, Cl. 81-437.000.

Bottom, James T.; Arnold, James J.; and Thompson, Francis P. Composite T-shirt construction. 4,466,136, Cl. 2-115.000.

Bottoms, Joseph A.: *See*—
Price, Elvin C.; Young, James R.; and Bottoms, Joseph A., 4,466,367, Cl. 112-134.000.

Boudjouk, Philip R.; and Han, Byung-Hee, to North Dakota State University Development Foundation. Organic sonochemistry process. 4,466,870, Cl. 204-158.00S.

Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , to Rousel Uclaf. Certain decahydro-7H-benz(e)-inden-7-ones, compositions containing same and method of use. 4,466,971, Cl. 424-266.000.

Boxall, Larry G.; and Townsend, Douglas W., to Martin Marietta Corporation. Control of ledge formation in aluminum cell operation. 4,466,995, Cl. 422-113.000.

Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., to Martin Marietta Corporation. Aluminum cell cathode coating method. 4,466,996, Cl. 427-122.000.

Bozarth, Gene A.: *See*—
Sundelin, Kurt G. R.; and Bozarth, Gene A., 4,466,823, Cl. 71-115.000.

Braid, Milton, to Mobil Oil Corporation. Method for the preparation of transition metal complexes. 4,466,925, Cl. 260-439.00R.

Brake, Bobby G.: *See*—
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., 4,466,837, Cl. 106-85.000.

Brakora, Anthony J.: *See*—
Bennington, James E.; Boerma, Michael J.; Brakora, Anthony J.; Locker, Donald H.; and Rhoades, Terence J., 4,466,294, Cl. 73-862.130.

Brand, Leonard J.; and Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl indolamines. 4,467,096, Cl. 548-247.000.

Brane, Douglas K.: *See*—
Brane, Earl P.; Brane, Douglas K.; and Hammond, Hilton H., 4,466,457, Cl. 137-599.100.

Brane, Earl P.; Brane, Douglas K.; and Hammond, Hilton H. Bypass and hard water mix valve. 4,466,457, Cl. 137-599.100.

Braungardt, Karl-Heinz: *See*—
Lamatsch, Hans; Schmidt, Helmut; Ulrich, Bodo; and Braungardt, Karl-Heinz, 4,466,182, Cl. 29-596.000.

Breiden, Karl. Finger model. 4,466,800, Cl. 434-267.000.

Brevetti Elettrogalvanici Superfiniture S.R.L.: *See*—
Angelini, Sergio, 4,466,618, Cl. 277-12.000.

Briner, Clifton F., to American Standard Inc. Chimney assembly. 4,466,340, Cl. 98-60.000.

Briscoe, James E., to Halliburton Company. Liquid gel concentrates and methods of using the same. 4,466,890, Cl. 252-8.55R.

Brisken, Thomas A.: *See*—
Napoli, Phillip D.; Harris, Robert W.; and Brisken, Thomas A., 4,466,239, Cl. 60-39.020.

Brodbeck, Hans: *See*—
Gallati, Harald; and Brodbeck, Hans, 4,467,031, Cl. 435-7.000.

Broekhoff, Johan C. P.: *See*—
Appel, Peter W.; Den Outer, Robert D.; Schutter, Klaas; and Broekhoff, Johan C. P., 4,466,897, Cl. 252-108.000.

Brongersma, Hidde H., to U.S. Philips Corporation. Double crucible method of fabricating optical fibers. 4,466,818, Cl. 65-3.130.

Brooks, Gary T.; and Cole, Bill W., to Standard Oil Company (Indiana). Injection moldable amide-imide polymers and copolymers containing amorphous polyamides. 4,467,011, Cl. 428-245.000.

Broome, J. Wesley; and Witt, Richard W., to Lakeland Hydraulics, Inc. Control valve for hydraulic motor apparatus. 4,466,336, Cl. 91-420.000.

Brorein, William J., to GK Technologies, Inc. Plural conductor communication wire. 4,467,138, Cl. 174-115.000.

Brouwer, Charles W.; Cowan, Larry C.; Horton, Robert; and Wueger, Karl W., to Leesona Corporation. Strand delivery system. 4,466,468, Cl. 139-435.000.

Brouwer, Charles W.; and Wueger, Karl W., to Leesona Corporation. Air weft insertion nozzle control system. 4,466,469, Cl. 139-435.000.

Brown, Glenn W.: *See*—
Lund, Richard B.; and Brown, Glenn W., 4,467,117, Cl. 568-637.000.

Brown, Herbert J.: *See*—
Matulevich, Edward S.; Brown, Herbert J.; and Kumar, Ajith K. N., 4,467,408, Cl. 363-54.000.

Brown, Mitchell P.: *See*—
Cane, Albert; and Brown, Mitchell P., 4,466,934, Cl. 264-106.000.

Brown, Thomas H.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Dioxocyclobutene compounds. 4,466,970, Cl. 424-263.000.

Brownstein, Lois H. Offset mouthpiece structure for underwater breathing. 4,466,434, Cl. 128-207.140.

Bruckner Apparatebau GmbH: *See*—
Schuierer, Manfred, 4,466,149, Cl. 8-151.000.

Bruder, Alan H., to Polaroid Corporation. Lithium batteries with organic slurry cathodes. 4,466,470, Cl. 141-1.100.

Brun, Claude; and Pelletier, Robert, to Ato Chimie. Process for polymerization in a gaseous phase using heterogeneous catalysis and a spherical reactor for carrying out the process. 4,467,080, Cl. 526-62.000.

Bruni, Maurice; Delode, Georges; and Perraudin, Rolland, to L'Air Liquide - Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Preparation and use of high porosity silicocalcareous mass. 4,467,040, Cl. 501-80.000.

Bruni, Maurice; Delode, Georges; and Perraudin, Rolland, to L'Air Liquide - Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude. Silicocalcareous mass with high porosity and its preparation. 4,467,041, Cl. 501-80.000.

Brunnmueller, Friedrich: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.

Bryan, Edward L.: *See*—
Owen, Thomas E.; Darilek, Glenn T.; Peters, Wendell R.; and Bryan, Edward L., 4,467,283, Cl. 324-363.000.

Buchovecky, Kalman E.: *See*—
Booz, A. David; Buchovecky, Kalman E.; Cebulak, Walter S.; Kuchera, Ray A.; and White, David D., Jr., 4,466,786, Cl. 425-7.000.

Buchta, William M.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,466,996, Cl. 427-122.000.

Buckhorn Material Handling Group Inc.: *See*—
Tabler, Charles P.; and Miller, Daniel R., 4,466,541, Cl. 206-506.000.

Bud Antle, Inc.: *See*—
Hanacek, William A.; and Bickel, Paul, 4,466,554, Cl. 221-1.000.

Buddy L Corporation: *See*—
Hanazato, Hiroshi, 4,466,215, Cl. 446-469.000.

Bugaut, Andree; and Andrillon, Patrick, to L'Oreal. Dyeing compositions containing 3-amino-4-nitroanisole derivatives and their use in dyeing keratin fibres as well as certain new said derivatives. 4,466,806, Cl. 8-414.000.

Buhrer, Rudolf, to Teca-Print AG. Offset intaglio printer having a spreader with a laterally extending slot. 4,466,348, Cl. 101-163.000.

Bulten, Eric J.: *See*—
Verbeek, Francois; Bulten, Eric J.; and Berg, Jan, 4,466,924, Cl. 260-429.00R.

Burchesky, Robert D.: *See*—
Coplan, Myron J.; and Burchesky, Robert D., 4,467,001, Cl. 427-434.600.

Burlington Industries, Inc.: *See*—
Baldwin, A. Frank, 4,467,013, Cl. 428-289.000.

Burnham, Robert W., to Boeing Company, The. Directional control device for aircraft. 4,466,586, Cl. 244-75.00R.

Burns, Carmen D., to National Semiconductor Corporation. Integrated circuit packaging process. 4,466,183, Cl. 29-827.000.

Burr-Brown Corporation: *See*—
Stitt, Robert M., 4,467,286, Cl. 330-86.000.

Burrage, Robert H. Adjustable tie strap. 4,466,159, Cl. 24-16.0PB.

Burroughs Corporation: *See*—
Coyne, David, 4,467,253, Cl. 318-636.000.
Kim, Dongsung R., 4,467,410, Cl. 364-200.000.
Potash, Hanan; Levin, Barton L.; and Genter, Melvyn E., 4,467,409, Cl. 364-200.000.
Shima, George T., 4,467,443, Cl. 364-900.000.
Stopper, Herbert, 4,467,400, Cl. 361-403.000.

Busboom, Garry W.: *See*—
Hoefer, Wayne A.; and Busboom, Garry W., 4,466,447, Cl. 130-27.00F.

Buse, Frederick W., to Ingersoll-Rand Company. Lubrication device. 4,466,508, Cl. 184-13.100.

Bushman, James B.; Weldon, Clark P.; and Wolfson, Stephen L., to Harco Corporation. Electrical surveys of underwater or underground structures with electrode-to-electrolyte potential correction. 4,467,274, Cl. 324-71.100.

Bussmann, Alfons: *See*—
Rammler, Roland; and Bussmann, Alfons, 4,466,863, Cl. 202-99.000.

Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., to Cosden Technology, Inc. Polymerization inhibition process for vinyl aromatic compounds. 4,466,905, Cl. 252-403.000.

Butler, James R.: *See*—
Watson, James M.; Butler, James R.; and Mikkelson, Karen A., 4,466,904, Cl. 252-402.000.

Butterworth, George A. M.; Evans, William M.; and Goldner, Howard J., to American Hospital Supply Corporation. Sterilization container formed of nonwoven material. 4,466,552, Cl. 220-354.000.

Byers, J. Hal, to Byers, J. Hal. Optical fiber travel direction indicator for model railroads. 4,466,588, Cl. 246-122.00A.

Bystronic Maschinen AG: *See*—
Zwahlen, Hermann; and Remund, Ulrich, 4,466,543, Cl. 209-556.000.

Caldwell, Kenneth B., to Associated Engineering Limited. Automatic speed control systems. 4,467,428, Cl. 364-426.000.

Calspan Corporation: *See*—
Baier, Robert E.; King, Raymond W.; and Meyer, Anne E., 4,466,277, Cl. 73-61.200.

Calvo, Luis C.; Obernier, Irene C.; and Hasher, Steve J., to Germaine Monteil Cosmetiques Corporation. Skin bleaching stick containing hydroquinone. 4,466,955, Cl. 424-62.000.

Camboulives, Andre A. M. L., to S.N.F.C.M.A. Axial locking device for turbomachine blades. 4,466,776, Cl. 416-221.000.

Camboulives, AndreA. M. L.; and Mandet, Gerard M. F., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation ("S.N.E.C.M.A."). Wet pipe device for turbojet engines. 4,466,573, Cl. 239-265.410.

Campolito, James J. Adjustable manhole cover. 4,466,219, Cl. 52-20.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Dyck, Walter; Wenner, Bernard J.; and Fenrick, Walter J., 4,466,437, Cl. 128-327.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
MacDonald, Robert I., 4,466,694, Cl. 350-96.190.

Cane, Albert; and Brown, Mitchell P., to Discovision Associates. Hot sprue valve assembly for an injection molding machine. 4,466,934, Cl. 264-106.000.

Canon Kabushiki Kaisha: *See*—
Fujii, Motoharu; Koumura, Noboru; Sato, Yasushi; Ayata, Naoki; and Saito, Seiji, 4,467,348, Cl. 358-78.000.
Haraguchi, Shosuke; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Tosaka, Yoichi, 4,466,719, Cl. 354-173.110.
Hirohata, Michio, 4,466,725, Cl. 354-403.000.
Ikari, Hideo; and Hirohata, Michio, 4,466,723, Cl. 354-400.000.
Ikemori, Keiji; and Tanaka, Kazuo, 4,466,707, Cl. 350-422.000.
Itani, Takashi, 4,467,379, Cl. 360-96.500.
Kato, Masatake; and Hashimoto, Shigeru, 4,466,710, Cl. 350-464.000.
Kawamura, Naoto; and Matsumoto, Kazuya, 4,467,195, Cl. 250-216.000.
Masaki, Nobuo, 4,466,736, Cl. 355-75.000.
Masunaga, Makoto, 4,466,724, Cl. 354-402.000.
Nishimoto, Yoshifumi, 4,466,703, Cl. 350-379.000.
Sakurai, Atsushi, 4,467,446, Cl. 364-900.000.
Suzuki, Takashi; Kitagishi, Nozomu; and Matsumura, Susumu, 4,467,188, Cl. 250-204.000.
Tanaka, Kano; and Takeda, Hiroaki, 4,467,246, Cl. 315-158.000.
Tsunekawa, Tokuichi; and Amikura, Takashi, 4,467,187, Cl. 250-204.000.
Yokota, Hideo, 4,466,711, Cl. 350-464.000.

Cantou, Christian, to La Radiotechnique. System for digitizing and processing video signals and a television signal receiver comprising such a system. 4,467,357, Cl. 358-148.000.

Carl Freudenberg, Firma: *See*—
Kalwar, Klaus; Freytag, Egon; Hirschinger, Lothar; and Ebner, Klaus, 4,467,200, Cl. 250-324.000.

Carl Manufacturing Co., Ltd.: *See*—
Mori, Chuzo, 4,466,322, Cl. 83-468.000.

Carl-Zeiss-Stiftung: *See*—
Herzog, Klaus, 4,466,195, Cl. 33-174.00L.

Carl-Zeiss-Stiftung, Heidenheim/Brenz, d/b/a Carl Zeiss, Oberkochen: *See*—
Muller, Gerhard; and Kreuttner, Albert, 4,467,208, Cl. 250-483.100.

Carlson, Gene D.; and Trahanovsky, Walter S., to Frye Copysystems, Inc. Chemical carbonless copy paper. 4,467,337, Cl. 346-209.000.

Carlsson, Bo; Stymne, Hans; and Wettermark, Gunnar. Method and apparatus in storing heat. 4,466,478, Cl. 165-1.000.

Carnaghi, Arturo S., to Angelica Corporation. Garment which can accommodate a large number of waist sizes and which is held by an automatically-adjustable-length drawstring. 4,466,137, Cl. 2-237.000.

Carney, James K., to Honeywell Inc. Self-aligned coupling of optical fiber to semiconductor laser or LED. 4,466,696, Cl. 350-96.200.

Carpenter, Roy B., Jr. Lightning protector and filter. 4,467,390, Cl. 361-56.000.
Carpentier, John R.; and Turner, Ruth L. Seat back mounted tray holder. 4,466,659, Cl. 297-191.000.
Carroll, Arthur B., to Carroll Manufacturing Corporation. Parabolic light emitter and detector unit. 4,467,193, Cl. 250-216.000.
Carroll Manufacturing Corporation: *See*—
Carroll, Arthur B., 4,467,193, Cl. 250-216.000.
Carus Corporation: *See*—
Mein, Peter G., 4,466,950, Cl. 423-599.000.
Casagrande, Cesare; and Ferrari, Giorgio, to Simes S.p.A. Precursors to ethylenediamine derivatives. 4,467,094, Cl. 546-334.000.
Casals-Stenzel, Jorge: *See*—
Nikolson, Robert C.; Vorbruggen, Helmut; Casals-Stenzel, Jorge; and Mannesmann, Gerda, 4,466,969, Cl. 424-263.000.
Case, Roger: *See*—
Boichot-Castagne, Bernard; Case, Roger; and Pezelet, Jackie, 4,467,297, Cl. 335-8.000.
Catio Computer Co., Ltd.: *See*—
Sano, Shigenori; and Hanzawa, Kohtaro, 4,467,440, Cl. 364-724.000.
Casler, William A.; and Saurenman, Phillip E. Process for forming curved structures, and the resulting structures. 4,466,267, Cl. 72-368.000.
Catalysts & Chemicals Ind. Co. Ltd.: *See*—
Imanari, Makoto; Oshida, Bunzi; Arima, Yusaku; Tanaka, Hirokazu; Todo, Yoshinori; Kobayashi, Norihisa; and Sera, Toshikuni, 4,466,947, Cl. 423-239.000.
Caterpillar Tractor Co.: *See*—
Morris, Hugh C., 4,466,462, Cl. 138-42.000.
Cauthron, David L.: *See*—
Eby, John C., Jr.; Cauthron, David L.; Ludeman, Michael M.; and Hicks, James R., 4,467,354, Cl. 358-133.000.
Cavalla, John F.; and Stephens, Roger J., to John Wyeth & Brother Limited. Pharmaceutical compositions. 4,466,963, Cl. 424-244.000.
CBS Biotechnic SA: *See*—
Sandhaus, Sami, 4,466,796, Cl. 433-173.000.
Cebulak, Walter S.: *See*—
Booz, A. David; Buchovecky, Kalman E.; Cebulak, Walter S.; Kuchera, Ray A.; and White, David D., Jr., 4,466,786, Cl. 425-7.000.
Cederstrand, Carl N.: *See*—
Warnke, Dale F.; and Cederstrand, Carl N., 4,467,435, Cl. 364-497.000.
Celanese Corporation: *See*—
Sawyer, Linda C., 4,466,237, Cl. 57-254.000.
Cella, James A.: *See*—
Verbicky, John W., Jr.; Cella, James A.; and O'Neil, Elbridge A., Jr., 4,467,097, Cl. 548-461.000.
Cenedella, Richard W.: *See*—
Pauly, John A.; and Cenedella, Richard W., 4,467,163, Cl. 219-10.55F.
Central Glass Company Limited: *See*—
Kawai, Toshikazu; and Negishi, Akira, 4,467,124, Cl. 568-842.000.
Cerami, Anthony; and Yamin, Michael A., to Evreka, Inc. Photosensitive compositions and products. 4,466,941, Cl. 422-57.000.
CGEE Alsthom: *See*—
Jusseau, Marcel; Borne, Andre ; Fermond, Gilbert; and Heng, Jean P., 4,466,682, Cl. 339-97.00R.
Chalfin, Edward; and Gontowski, Walter S., Jr., to Sprague Electric Company. Photo diode with auxiliary photo diode regulator. 4,467,191, Cl. 250-214.00A.
Chalk, Alan J.; Magennis, Steven A.; Wertheimer, Vasile S.; and Naipawer, Richard E., to Givaudan Corporation. Process for the catalytic synthesis of conjugated dienes from dialkylallylamines. 4,467,118, Cl. 568-687.000.
Chambers, Benjamin C., to Martin Marietta Corporation. Means and method for adjusting and connecting cords. 4,466,161, Cl. 24-115.00R.
Chambers, Derek; and Wang, Dee, to Raytheon Company. Digitally controlled power supply. 4,467,268, Cl. 323-222.000.
Champion International Corporation: *See*—
Conroy, James R., 4,466,798, Cl. 434-118.000.
Champion, James R.; and Pries, Robert W., to International Business Machines Corporation. Electrophotographic machine with high density toner concentration control. 4,466,731, Cl. 355-14.00D.
Champion Spark Plug Italiana S.p.A.: *See*—
Maiocco, Giuseppe A.; and Frascarolo, Pietro, 4,466,262, Cl. 70-252.000.
Chan, Keng S.; and Majoros, Stephen J., to Standard Oil Company, The. Caustic flooding with stabilized water for enhanced oil recovery. 4,466,892, Cl. 252-8.55D.
Chance, Peter E.; and Weiss, Mitchell, to United States Robots, Inc. Robot arm controller with common bus memory. 4,467,436, Cl. 364-513.000.
Chandler Evans Inc.: *See*—
Howlett, James J.; and Zagranski, Raymond D., 4,466,526, Cl. 192-0.096.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Conversion of alcohols and ethers to distillate range hydrocarbons. 4,467,133, Cl. 585-733.000.
Chang, Gee-Kung; Hartman, Adrian R.; and Weston, Harry T., to AT&T Bell Telephone Laboratories, Incorporated. Bidirectional switch using two gated diode switches in a single dielectrically isolated tub. 4,467,344, Cl. 357-39.000.
Chang, Tao: *See*—
Huang, Cheng-Chung; and Chang, Tao, 4,466,738, Cl. 356-4.500.
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., to PPG Industries, Inc. Gelable, silicate rich resins from hydrophobic polyols and volatile and/or incompatible organosilicates. 4,467,081, Cl. 528-26.000.
Chao, Hu H., to International Business Machines Corporation. Storage capacitor optimization for one device FET dynamic RAM cell. 4,466,177, Cl. 29-571.000.
Charas, Philip M.; Gustavsson, Per-Olof G.; and Morwing, Bo A., to Telefonaktiebolaget L M Ericsson. Method and apparatus for preventing the response of a radar beacon to receive radar pulses originating from the side lobes of a transmitter and an arrangement. 4,467,326, Cl. 343-6.50R.
Charles Stark Draper Laboratory, Inc., The: *See*—
Curtiss, William P., 4,467,262, Cl. 318-811.000.
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., to Halliburton Company. Liquid water loss reducing additives for cement slurries. 4,466,837, Cl. 106-85.000.
Check View System S.A.: *See*—
Chevalier, Louis; and Coudert, Jean, 4,466,584, Cl. 242-199.000.
Cheklich, George E., to United States of America, Army. Apparatus for closed-loop combustion control in internal combustion engines. 4,466,408, Cl. 123-425.000.
Chellis, Fred F., deceased (by Chellis, June M., executrix); and Lessard, Philip A., to Helix Technology Corporation. Fluid actuator for cryogenic valve. 4,466,251, Cl. 62-6.000.
Chellis, June M., executrix: *See*—
Chellis, Fred F., deceased; and Lessard, Philip A., 4,466,251, Cl. 62-6.000.
Chemische Werke Huls AG: *See*—
Juretzek, Heinz; Kriesten, Wolfgang; and Sindermann, Paul, 4,466,330, Cl. 86-20.00R.
Cheney, Richard F.; and Bansal, Anil, to GTE Products Corporation. Method of recovering metal carbides. 4,466,945, Cl. 423-53.000.
Cherry Electrical Products Corporation: *See*—
Murmann, Gunter; and Bauer, Gunter, 4,467,160, Cl. 200-159.00A.
Chevalier, Louis; and Coudert, Jean, to Check View System S.A. Apparatus for counting and limiting the number of plays of a cassette. 4,466,584, Cl. 242-199.000.
Chevron Research Company: *See*—
Aoyagi, Edward I., 4,466,962, Cl. 424-200.000.
Stayner, Robert A., 4,466,909, Cl. 252-49.500.
Chiarelli, Edoardo: *See*—
Bandoli, Fulvio; and Chiarelli, Edoardo, 4,467,385, Cl. 361-24.000.
Chicherin, Jury E.: *See*—
Dshkhunian, Valery L.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,467,413, Cl. 364-200.000.
Chida, Shintaro: *See*—
Hirashima, Shigeaki; and Chida, Shintaro, 4,466,782, Cl. 417-517.000.
Chiu, Te-Long; and Lien, Jih-Chang, to Texas Instruments Incorporated. Electrically programmable floating gate semiconductor memory device. 4,467,453, Cl. 365-185.000.
Chomik, Michael W.: *See*—
Arnon, Ephraim; Chomik, Michael W.; and Barlow, Christopher J., 4,467,473, Cl. 370-100.000.
Chonan, Kenichi: *See*—
Ito, Tosikazu; and Chonan, Kenichi, 4,466,480, Cl. 165-12.000.
Chow, Kuen: *See*—
Rode, Jonathan P.; and Chow, Kuen, 4,467,340, Cl. 357-24.000.
Christian, J. Vernon. Solid fuel warm air furnace. 4,466,358, Cl. 110-211.000.
Christiansen, Uwe; Rau, Karlheinz; and Simmat, Fritz, to Heraeus Quarzschmelze GmbH. Lightweight mirror especially for astronomical purposes. 4,466,700, Cl. 350-310.000.
Christie Electric Corp.: *See*—
Knipp, Roger W., 4,467,389, Cl. 361-151.000.
Chrysostome, Gerard: *See*—
Kissel, Rolande; Berger, Pierre; and Chrysostome, Gerard, 4,466,809, Cl. 48-197.00R.
Chu, Joseph Y. C.; and Von Hoene, Donald C., to Xerox Corporation. Layered photoresponsive device containing hole injecting ground electrode. 4,467,023, Cl. 430-66.000.
Chupp, John P.; and Alt, Gerhard H., to Monsanto Company. Nitromethyl or ethyl substituted benzotrifluoride. 4,467,125, Cl. 568-936.000.
Chuwman, Tsutomu: *See*—
Takeshita, Hiroshi; Chuwman, Tsutomu; and Yamamoto, Susumu, 4,466,673, Cl. 303-22.00R.
Ciba-Geigy Corporation: *See*—
Horlacher, Paul; and Pfenninger, Heinz, 4,466,900, Cl. 252-301.230.
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,467,101, Cl. 549-76.000.
Lund, Richard B.; and Brown, Glenn W., 4,467,117, Cl. 568-637.000.
Martin, Henry, 4,466,822, Cl. 71-77.000.
Schwander, Hansrudolf, 4,467,088, Cl. 544-197.000.
Cifrese, Ralph; Medri, Mario W.; and Abbazia, Leonard P., to Warner-Lambert Company. Substantially non-aqueous semi-liquid center-fill. 4,466,983, Cl. 426-5.000.
Ciprich, Samuel D.: *See*—
Ruyak, Robert F.; Ratkowski, Stephen G.; Ciprich, Samuel D.; and Silver, Theodore R., 4,466,276, Cl. 73-59.000.

Citta, Richard W.; and Lee, Ronald B., to Zenith Electronics Corporation. Television signal scrambling system and method. 4,467,353, Cl. 358-120.000.

Claassen, Peter; Denk, Heimo; and Moser, Werner, to List, Hans. Device for determining a trigger point on an electric signal with given amplitude distribution over time. 4,467,433, Cl. 364-481.000.

Clarion Co., Ltd.: *See*—
Sakai, Takamasa; and Sato, Yasuhiko, 4,466,876, Cl. 204-298.000.
Takishima, Shoji, 4,466,181, Cl. 29-589.000.

Clark, Albert R.; Ernst, William A.; Mitrovich, Svetislav; and Self, James E., to Mead Corporation, The. Sheet inverting device. 4,466,607, Cl. 271-225.000.

Clark, Douglas; and Overby, Victor. Image projector with double terminal lamp fixture. 4,466,715, Cl. 353-45.000.

Clark, Frederic L.: *See*—
Bobick, Thomas W.; Clark, Frederic L.; and Paranjpe, Suresh C., 4,467,366, Cl. 358-296.000.

Clarke, David R., to Rockwell International Corporation. Electrolysis treatment for drawing ions out of a ceramic. 4,466,820, Cl. 65-30.140.

Clem, Arthur G. Waterproofing structure. 4,467,015, Cl. 428-454.000.

Cleveland, Joseph J.: *See*—
Dorazio, Raymond E.; Mingos, William L.; and Cleveland, Joseph J., 4,466,482, Cl. 165-145.000.

Cockram, Geoffrey N.: *See*—
Towersey, Peter J.; Longton, John; and Cockram, Geoffrey N., 4,466,988, Cl. 426-656.000.

Cocron, Istvan: *See*—
Lermann, Peter; Cocron, Istvan; and Fauth, Gunter, 4,466,718, Cl. 354-408.000.

Coe, David J., to U.S. Philips Corporation. Manufacture of vertical insulated gate field effect transistors. 4,466,175, Cl. 29-571.000.

Coffman, Donald H.: *See*—
Balliet, Layton; Coffman, Donald H.; and Gomez, Carlos, 4,467,196, Cl. 250-227.000.

Cogswell, John; and Fokos, Robert F., to Special Products Engineering Corporation. Rotary cutting system for a printing press. 4,466,319, Cl. 83-116.000.

Cohen, Martin B., to Latin Percussion, Inc. Instrument accessory clamping device. 4,466,596, Cl. 248-635.000.

Cohen, Morris; and Underkofler, Leon M., to Loral Corporation. Integrated electronic controlled diode filter microwave networks. 4,467,296, Cl. 333-202.000.

Cole, Bill W.: *See*—
Brooks, Gary T.; and Cole, Bill W., 4,467,011, Cl. 428-245.000.

Cole, Denver C. Rotary mower. 4,466,235, Cl. 56-16.900.

Collin, Edwin J.; and Jencks, Charles L., to General Electric Company. Adapter assembly for circuit breaker undervoltage release accessory. 4,467,299, Cl. 335-20.000.

Colonna, William J.: *See*—
Horwath, Robert O.; and Colonna, William J., 4,467,033, Cl. 435-105.000.

Colt Industries Operating Corp: *See*—
Arkus-Duntov, Zora, 4,466,389, Cl. 123-52.0MB.

Colwell, Dennis J.: *See*—
Basile, Peter A.; Annese, Clara Ann; and Colwell, Dennis J., 4,466,342, Cl. 99-323.100.

Comau S.p.A.: *See*—
Mautino, Sergio, 4,466,765, Cl. 414-277.000.

Combustion Engineering, Inc.: *See*—
Waryasz, Richard E., 4,466,385, Cl. 122-510.000.

Commissariat a l'Energie Atomique: *See*—
Piaget, Bernard; and Piquard, Jean-Francois, 4,467,237, Cl. 310-334.000.

Compagnie de Signaux et d'Entreprises Electriques: *See*—
Even, Andre; Fortier, Christian; Guillard, Michel G.; Hedoin, Dominique; Le Guen, Serge; and Raucourt, Dominique, 4,467,430, Cl. 364-436.000.

Compagnie Francaise de Raffinage: *See*—
Marty, Claude; and Engelhard, Philippe, 4,466,906, Cl. 502-11.000.

Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See*—
Mollier, Jean H., 4,467,139, Cl. 178-22.080.

Compair Maxam Limited: *See*—
Higgins, Godfrey A., 4,466,459, Cl. 137-624.110.

Conchemco, Incorporated: *See*—
Beugelsdyk, Anthony F.; and Barnard, Michael A., 4,466,232, Cl. 56-10.800.
Kester, Bruce J.; Urban, Arthur L.; and Kester, Dale C., 4,466,308, Cl. 74-483.00R.

Conforti, Frederick J.; and Fenne, Kenneth R., to Pittway Corporation. Rechargeable battery-powered flashlight system. 4,467,263, Cl. 320-2.000.

Conkling, William C. Manually manipulated agricultural implement with seed enclosure having tooth members extending out of holes in the enclosure. 4,466,365, Cl. 111-72.000.

Conoco Inc.: *See*—
Rice, George W., 4,467,461, Cl. 367-70.000.
Sweeney, William T.; Shaw, Rick L.; and Webb, Frederick A., 4,466,759, Cl. 406-15.000.

Conroy, James R., to Champion International Corporation. Printed computer training device. 4,466,798, Cl. 434-118.000.

Conti, Natale; and Tardani, Massimo, to Montedison S.p.A. Foams based on low formaldehyde-emission urea-formaldehyde resin and process for their preparation. 4,467,054, Cl. 521-188.000.

Control Data Corporation: *See*—
Johnson, Robert J.; Miller, Charles N.; and Bonnie, G. Patrick, 4,467,151, Cl. 200-5.00A.
Smith, Donald O.; and Harte, Kenneth J., 4,467,211, Cl. 250-492.200.

Conyne, Richard F.: *See*—
Taylor, John A.; and Conyne, Richard F., 4,467,206, Cl. 250-435.000.

Cooke, Arthur V.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,466,996, Cl. 427-122.000.

Coolidge, Daniel S.: *See*—
Stafford, James A.; Neiss, Richard W.; and Coolidge, Daniel S., 4,467,148, Cl. 179-175.30R.

Cooper, Kelvin: *See*—
Richardson, Kenneth; and Cooper, Kelvin, 4,466,974, Cl. 424-269.000.

Coplan, Myron J.; and Burchesky, Robert D., to Albany International Corp. Process and device for applying, drying and curing a coating on filaments. 4,467,001, Cl. 427-434.600.

Coppage, Edward A., Jr. Bulletproof dress shirt. 4,466,135, Cl. 2-2.500.

Corbari, George V. Safety stud. 4,466,205, Cl. 36-134.000.

Cornacchia, Felice; and Piritore, Giuseppe, to Fiat Auto S.p.A. Rigid axle suspension for motor vehicles. 4,466,636, Cl. 280-724.000.

Corning Glass Works: *See*—
Beall, George H.; and Megles, John E., Jr., 4,467,039, Cl. 501-3.000.

Coaden Technology, Inc.: *See*—
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., 4,466,905, Cl. 252-403.000.
Fortuna, Vincent E., 4,466,845, Cl. 156-73.500.
MacLaughlin, Donald N.; and Fortuna, Vincent E., 4,466,844, Cl. 156-69.000.
Watson, James M.; Butler, James R.; and Mikkelson, Karen A., 4,466,904, Cl. 252-402.000.

Costigan, Conrad A., to Spreading Machine Exchange, Inc. Adjustable motion control apparatus for fabric spreading machines. 4,466,602, Cl. 270-31.000.

Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See*—
Pariani, Emilio, 4,466,773, Cl. 416-134.00A.

Cotter, Byron R.: *See*—
Lin, Henry C.; and Cotter, Byron R., 4,466,927, Cl. 260-544.00C.

Coudert, Jean: *See*—
Chevalier, Louis; and Coudert, Jean, 4,466,584, Cl. 242-199.000.

Couture, Paul A., to Wasco Products, Inc. Thermal barrier skylight. 4,466,221, Cl. 52-200.000.

Cowan, Larry C.: *See*—
Brouwer, Charles W.; Cowan, Larry C.; Horton, Robert; and Wueger, Karl W., 4,466,468, Cl. 139-435.000.

Coy, Don R., Jr.: *See*—
Giannis, Peter M.; and Coy, Don R., Jr., 4,466,583, Cl. 242-198.000.

Coyne, David, to Burroughs Corporation. Differential signal decoder. 4,467,253, Cl. 318-636.000.

Cozzi, Gianfranco, to Selenia, Industrie Elettroniche Associate, S.p.A. Signal amplifier with wide linear dynamic range. 4,467,290, Cl. 330-290.000.

Cray Research, Inc.: *See*—
Roush, M. Dean, 4,466,255, Cl. 62-259.200.

Creasy, Walter S., to Hydromer, Inc. Transparent anti-fog coating compositions. 4,467,073, Cl. 525-127.000.

Creative Glassworks International: *See*—
Morgan, George M.; and Hinkens, Dale R., 4,467,168, Cl. 219-121.0LG.

Creusot-Loire: *See*—
Kissel, Rolande; Berger, Pierre; and Chrysostome, Gerard, 4,466,809, Cl. 48-197.00R.

Cristobal, Carlos C.: *See*—
Palacio, Joaquin J.; and Cristobal, Carlos C., 4,466,223, Cl. 52-404.000.

Critikon, Inc.: *See*—
Ho, Nelson; Thompson, Bryan; and Kratochvil, Jiri, 4,466,879, Cl. 204-415.000.

Crofts, David, to Raychem Limited. Dimensionally-recoverable article. 4,467,002, Cl. 428-36.000.

Crump, Druce K.; and Wilson, David A., to Dow Chemical Company, The. Cement compositions containing set retarders. 4,466,835, Cl. 106-90.000.

Crump, Druce K.; and Wilson, David A., to Dow Chemical Company, The. Set retarding compounds for use in cement slurries. 4,466,836, Cl. 106-90.000.

Cuneo, Edward A.; Montei, Harold R.; and Olivieri, Michael, to General Dynamics, Pomona Division. Method of making pressure point contact system. 4,466,184, Cl. 29-830.000.

Cunningham, Karl E.; and Wells, Michael F., to Ectron Corporation. Microprocessor controlled thermocouple simulator system. 4,466,749, Cl. 374-134.000.

Currie, William S., to Texaco Inc. Seismic method improving signal-to-noise ratio. 4,467,459, Cl. 367-21.000.

Curtiss, William P., to Charles Stark Draper Laboratory, Inc., The. Polyphase motor drive system with balanced modulation. 4,467,262, Cl. 318-811.000.

Cusano, Dominic A.: *See*—
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,466,929, Cl. 264-1.200.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,466,930, Cl. 264-1.200.

Cushing, David E.; Lemay, Richard A.; Stanley, Philip E.; and Woods, William E., to Honeywell Information Systems Inc. Logic transfer and decoding system. 4,467,416, Cl. 364-200.000.

Cushing, David E.: *See*—
Woods, William E.; Cushing, David E.; Lemay, Richard A.; and Stanley, Philip E., 4,467,417, Cl. 364-200.000.

CVI Incorporated: *See*—
Hood, Charles B., 4,466,252, Cl. 62-55.500.

Cycon, James P.; Krauss, Timothy A.; and Roman, Stephan, to United Technologies Corporation. Composite flexbeam joint. 4,466,774, Cl. 416-134.00A.

Daikin Kogyo Company, Limited: *See*—
Oka, Masahiko; Kano, Hideo; and Ueta, Yutaka, 4,467,074, Cl. 525-356.000.
Yoshimura, Tatsushiro; Nakazima, Takeaki; and Yokoi, Hiromasa, 4,466,832, Cl. 106-74.000.

Daimler-Benz AG: *See*—
Bauer, Karlheinz; Langenbeck, Andreas; Pfeiffer, Peter; and Tomforde, Johann, 4,467,402, Cl. 362-32.000.

Dainichi Kiko Kabushiki Kaisha: *See*—
Kouno, Toshio, 4,466,307, Cl. 74-479.000.

Dale Electronics, Inc.: *See*—
Person, Herman R.; and Johnson, Douglas E., 4,467,311, Cl. 338-293.000.

Dalet, Francis; and Ducourneau, Bernard, to Societe Nationale des Poudres et Explosifs. Dual-mode propellant charge with a trumpet-shaped channel possessing a star-shaped cross-section. 4,466,352, Cl. 102-288.000.

Dana Corporation: *See*—
Antonini, Joseph; and Zawodni, Frank W., 4,466,623, Cl. 277-153.000.
Lane, Wendell C., 4,466,524, Cl. 112-70.250.

Danhieux, Daniel M.: *See*—
Osselaere, Guy H. J.; and Danhieux, Daniel M., 4,466,230, Cl. 56-10.200.

Daniel, Maurice. Light dispersive optical lightpipes and method of making the same. 4,466,697, Cl. 350-96.300.

Danielsson, Mats P. A., to Santrade Ltd. Frictional element. 4,467,008, Cl. 428-156.000.

Dantsker, Edward, to ERS Engineering Corporation. Process for removing adhesive tape. 4,466,849, Cl. 156-248.000.

Dany, Franz-Josef: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Adam, Wilhelm, 4,467,056, Cl. 523-208.000.

Darbois, Paul: *See*—
Lotrous, Robert; and Darbois, Paul, 4,466,540, Cl. 206-387.000.

Darden, Jerome W., to Texaco Inc. Ethylenediamine triacetic acid siloxane stabilizers for inorganic silicates in antifreeze/coolant formulations. 4,466,896, Cl. 252-78.300.

Darilek, Glenn T.: *See*—
Owen, Thomas E.; Darilek, Glenn T.; Peters, Wendell R.; and Bryan, Edward L., 4,467,283, Cl. 324-363.000.

Darley, Henry M.; and Houston, Theodore W., to Texas Instruments Incorporated. Method for fabricating MESFET device using a double LOCOS process. 4,466,174, Cl. 29-571.000.

Das, Jagabandhu; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted carbamate prostaglandin analogs useful in treating platelet aggregation and bronchoconstriction. 4,466,979, Cl. 424-285.000.

Data Card Corporation: *See*—
Schmidt, Robert H.; Gerlach, Leroy E.; and Fordahl, Craig A., 4,467,335, Cl. 346-160.000.

Datawell B.V.: *See*—
Rademakers, Petrus J., 4,466,281, Cl. 73-170.00A.

Dathe, Joachim; and Holtschmidt, Walter, to Siemens Aktiengesellschaft. Implantation of an insulative layer. 4,466,839, Cl. 148-1.500.

Datseris, Philip S.; Sayder, Ali C.; and Palm, William J., to Education for the State of Rhode Island, The Board of Regents for. Apparatus for manipulating a workpiece or the like. 4,466,768, Cl. 414-729.000.

D'Aurora, Joseph R.; and Specht, David F. Investment game board and apparatus. 4,466,515, Cl. 273-256.000.

Davis, Dean I.; Ensz, Lyndon D.; and Grubelich, Matthew J., to AT&T Technologies, Inc.; and AT&T Bell Laboratories. Methods of making a terminal and products produced thereby. 4,466,689, Cl. 339-263.00R.

Davis, Harry C. Adjustable circular insulation saw system. 4,466,170, Cl. 29-561.000.

Davis, Steven J.; and Hanko, Leonard, to United States of America, Air Force. Halogen mass flow rate detection system. 4,467,474, Cl. 372-89.000.

Davis, Thomas J.; and Perry, Charles B., to Electric Power Research Institute, Inc. Multi frequency eddy current test apparatus with intermediate frequency processing. 4,467,281, Cl. 324-232.000.

Davy McKee Limited: *See*—
Dobson, John C.; and Hope, Thomas, 4,466,574, Cl. 239-455.000.

Dawdy, Terrance H., to Lord Corporation. Epoxy modified structural adhesives having improved heat resistance. 4,467,071, Cl. 525-112.000.

Dayco Corporation: *See*—
Wilson, Leslie B., 4,466,803, Cl. 474-138.000.

DBX, Inc.: *See*—
Aylward, Joseph R., 4,467,287, Cl. 330-126.000.

Deane, John D.; and Kotch, Robert J., to Reed Rock Bit Company. Compound dynamic seal for rolling cutter drill bit. 4,466,622, Cl. 277-92.000.

De Carolis, Joseph P.; and Billings, Lawrence L., to Stanley Works, The. Ratchet mechanism. 4,466,523, Cl. 192-43.100.

Dedek, Tomasz W., to AMSTED Industries Incorporated. Railroad brake shoe-brake beam assembly. 4,466,513, Cl. 188-243.000.

Deguchi, Toshihisa: *See*—
Ohta, Kenji; Deguchi, Toshihisa; and Takahashi, Akira, 4,467,383, Cl. 360-131.000.

Del Laboratories, Inc.: *See*—
Ferrari, Luigi M., 4,466,452, Cl. 132-75.000.

Del Mar Avionics: *See*—
Bachman, John A., 4,467,324, Cl. 340-722.000.

de Lima Castro Netto, Eduardo. Integral bag closure. 4,466,160, Cl. 24-30.50R.

Delmastro, John A.; and Van Duyn, Paul D., to General Motors Corporation. Energy absorbing bumper assembly for vehicles. 4,466,646, Cl. 293-117.000.

del Nero, Claude, to Fichet-Bauche. High safety lock devices. 4,466,264, Cl. 70-417.000.

Delode, Georges: *See*—
Bruni, Maurice; Delode, Georges; and Perraudin, Rolland, 4,467,040, Cl. 501-80.000.
Bruni, Maurice; Delode, Georges; and Perraudin, Rolland, 4,467,041, Cl. 501-80.000.

DeLong, Horace. Method and apparatus for separating viscera from and splitting gizzards. 4,466,158, Cl. 17-52.000.

DelPrete, Stephen D.: *See*—
Grant, John L.; Torti, Emanuel D.; O'Malley, Austin S.; Galligan, Thomas W.; and DelPrete, Stephen D., 4,466,684, Cl. 339-176.00M.

Deluhery, James G.: *See*—
Skubitz, Frank L.; and Deluhery, James G., 4,466,441, Cl. 128-419.00P.

DelVecchio, Leonard P., Jr.: *See*—
Grudzien, Christopher P., Jr.; and DelVecchio, Leonard P., Jr., 4,467,155, Cl. 200-81.00R.

Demetron Gesellschaftfur Electronik-Werstoffe mbh: *See*—
Siewert, G. A. Horst; Dietrich, Horst; Munz, Wolf-Dieter; and Goebel, Jorg, 4,466,940, Cl. 420-507.000.

Dendia-Werk Dr. Ing. Hans O. Scheid Gesellschaft M.B.H.: *See*—
Plischka, Gerhard, 4,466,795, Cl. 433-166.000.

Denk, Heimo: *See*—
Claassen, Peter; Denk, Heimo; and Moser, Werner, 4,467,433, Cl. 364-481.000.

Dennis, Richard S., to International Minerals & Chemical Corp. Process for recovery of uranium from wet process H_3PO_4. 4,466,944, Cl. 423-6.000.

Dennison Manufacturing Company: *See*—
Hubbard, Karl E.; and Ventre, Augustus, 4,466,994, Cl. 427-56.100.

Den Outer, Robert D.: *See*—
Appel, Peter W.; Den Outer, Robert D.; Schutter, Klaas; and Broekhoff, Johan C. P., 4,466,897, Cl. 252-108.000.

Deprez, Dominique: *See*—
Bizot, Jean; and Deprez, Dominique, 4,466,866, Cl. 204-78.000.

Dermall, Ltd.: *See*—
Bernstein, Joel E., 4,466,968, Cl. 424-260.000.

DeTorre, Robert P., to PPG Industries, Inc. Method of and apparatus for severing a glass sheet. 4,466,562, Cl. 225-2.000.

Detuzzi, Gregory. Time lapse programmer. 4,466,721, Cl. 354-267.100.

Deutsch, Gerlinde: *See*—
Kleinhammer, Gerd; Deutsch, Gerlinde; Linke, Hans-Ralf; Stahler, Fritz; and Gruber, Wolfgang, 4,467,030, Cl. 435-7.000.

Deutsche Babcock Anlagen Aktiengesellschaft: *See*—
Maurer, Erich; Rafael, Aruth; and Wefing, Heinrich, 4,466,384, Cl. 122-392.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Hinz, Bernhard; and Kochendorfer, Richard, 4,466,399, Cl. 123-193.0CP.

DeVorak, Dwight F. Trailer hitch having a winch coupling assist. 4,466,632, Cl. 280-478.00R.

De Wames, Roger E.; and Staples, Edward J., to Rockwell International Corporation. Surface acoustic wave interferometer. 4,467,235, Cl. 310-313.00D.

Dharia, Dilip: *See*—
Patel, Pinakin; Dharia, Dilip; and Maru, Hansraj, 4,467,050, Cl. 502-330.000.

Diamond Communication Products, Inc.: *See*—
Leonardo, Ignazio, 4,466,589, Cl. 248-61.000.

DiBianca, Frank A.: *See*—
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,466,929, Cl. 264-1.200.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,466,930, Cl. 264-1.200.

Dickert, Joseph J., Jr.: *See*—
Audeh, Costandi A.; Dickert, Joseph J., Jr.; and Fowles, Patrick E., 4,466,882, Cl. 208-11.00R.

Dickie, Robert G., to Northern Technologies, Ltd. Monitor bracket. 4,467,244, Cl. 315-3.000.

Dieck, Ronald L.; and Wambach, Allen D., to General Electric Company. Modified polyester composition. 4,467,057, Cl. 523-212.000.

Diehl GmbH & Co.: *See*—
Siebert, Rainer; and Bock, Erich, 4,467,401, Cl. 361-427.000.

Diesel Kiki Co., Ltd.: *See*—
Shibuya, Tsunenori, 4,466,522, Cl. 192-36.000.

Dietrich, Horst: *See*—
Siewert, G. A. Horst; Dietrich, Horst; Munz, Wolf-Dieter; and Goebel, Jorg. 4,466,940, Cl. 420-507.000.

Difflipp, Kurt; Emrich. Helmut; Erbach, Horst; Neberle, Klaus; Ochs, Heinrich; and Schwebe, Gunter, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Device for conveying ink or a damping agent. 4,466,347, Cl. 101-148.000.

Digital Equipment Corporation: *See*—
Leitermann, Richard; and Wilson, Bruce G., 4,467,150, Cl. 200-5.00A.

Dill, Walter R., to Halliburton Company. Method of preparing and using and composition for acidizing subterranean formations. 4,466,893, Cl. 252-8.55C.

Dille, Roger M.; Richter, George N.; Estabrook, Lawrence E.; Rohner, Jean-Georges P.; and Rhodes, Harold A., to Texaco Inc. Partial oxidation process. 4,466,810, Cl. 48-197.00R.

DiNitto, Robert G.; Harris, John C.; and Maciel, Robert F., to Instrumentation Laboratory Inc. Electrochemical electrode assembly. 4,466,878, Cl. 204-415.000.

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Cane, Albert; and Brown, Mitchell P., 4,466,934, Cl. 264-106.000.
Wilkinson, Richard L.; and Vitale, George, 4,467,467, Cl. 369-111.000.

Disko, Harry: *See*—
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Bachman, Gilbert; and Weaver, Gabriel H., 4,466,614, Cl. 273-139.000.

Dobson, John C.; and Hope, Thomas, to Davy McKee Limited. Cooling apparatus. 4,466,574, Cl. 239-455.000.

Dr. Ing. Rudolf Hill GmbH: *See*—
Beisswenger, Siegfried; and Boppel, Wolfgang, 4,467,205, Cl. 250-397.000.

Dodson, Vance H.; and Hayden, Thomas D., to W. R. Grace & Co. Corrosion inhibiting additive for cement compositions. 4,466,834, Cl. 106-89.000.

Dohi, Yoshihiko: *See*—
Kato, Shinichi; Dohi, Yoshihiko; Motosugi, Katsuhiko; and Koga, Ituo, 4,466,395, Cl. 123-188.00M.

Doi, Keiichiro: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Doi, Keiichiro; and Tanaka, Seiji, 4,467,162, Cl. 219-10.49R.

Dolan, James E.; and Sands, Timothy D., to United States of America, Energy. Rim-drive cable-aligned heliostat collector system. 4,466,423, Cl. 126-424.000.

Dolenti, Alfred N. Wire lift device for high tension electric line. 4,466,506, Cl. 182-2.000.

Doll, Brendan L. Apparatus and method for drying lumber. 4,466,198, Cl. 34-1.000.

Dorazio, Raymond E.; Mingos, William L.; and Cleveland, Joseph J., to GTE Products Corporation. Triple pass ceramic heat recuperator. 4,466,482, Cl. 165-145.000.

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Dorsch, Eddy H.; and Dorsch, Herbert, to Dorsch, Herbert. Afterburner for a wood stove. 4,466,421, Cl. 126-285.00A.

Dorsch, Herbert: *See*—
Dorsch, Eddy H.; and Dorsch, Herbert, 4,466,421, Cl. 126-285.00A.

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Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,466,500, Cl. 177-1.000.

Douthart, Robert H.; and Smith, Howard W., to A. O. Smith Corporation. Multiple speed induction motor. 4,467,257, Cl. 318-774.000.

Dow Chemical Company, The: *See*—
Crump, Druce K.; and Wilson, David A., 4,466,835, Cl. 106-90.000.
Crump, Druce K.; and Wilson, David A., 4,466,836, Cl. 106-90.000.
Spangle, Lloyd B., 4,466,833, Cl. 106-88.000.

Dow Corning Corporation: *See*—
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Doyel, Arthur T.: *See*—
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Drake, Douglas C.; Wismer, Kenneth L.; and Ulrich, Henry D., to Boeing Company, The. Active millimeter wave simulator for missile seeker evaluations. 4,467,327, Cl. 343-17.700.

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Leupold, Gerhard; and Hoppert, Hans, 4,467,396, Cl. 361-321.000.

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Dreiling, Mark J., to Phillips Petroleum Company. Healing pinhole defects in amorphous silicon films. 4,466,992, Cl. 427-39.000.

Dresser Industries, Inc.: *See*—
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Grudzien, Christopher P., Jr.; and DelVecchio, Leonard P., Jr., 4,467,155, Cl. 200-81.00R.
Van Houtte, James J., 4,466,640, Cl. 285-104.000.

Droessler, Justin G.; and Jain, Anil K., to Honeywell Inc. Curved tunable Fabry-Perot filter. 4,466,699, Cl. 350-166.000.

DSET Laboratories, Inc.: *See*—
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Dshkhunian, Valery L.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Telenkov, Vyacheslav V.; and Chicherin, Jury E. Microprocessor apparatus for data exchange. 4,467,413, Cl. 364-200.000.

DuBois, Chester G.: *See*—
McChesney, Richard M.; and DuBois, Chester G., 4,466,412, Cl. 123-492.000.

DuBois, R. Clark; and Hamma, John C., to Gradco Systems, Inc. Movable tray sheet sorter. 4,466,608, Cl. 271-293.000.

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Duff, David L. A., to Rumble Equipment Limited. Slip energy recovery control system using hybrid inverter to improve quadrature current consumption. 4,467,259, Cl. 318-800.000.

Dugge, Richard H.; and Rollins, Dallas W., to ACF Industries, Incorporated. Aerator control arrangement. 4,466,558, Cl. 222-195.000.

Dumery, Stefaan D., to Sprague Electric Company. Fine resolution liquid level detector. 4,466,284, Cl. 73-313.000.

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Dunn, J. Malcolm. Display packages. 4,466,534, Cl. 206-45.340.

Dunn, Michael P., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing a continuous glass filament mat. 4,466,819, Cl. 65-4.400.

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Du Pont de Nemours, E. I., and Company: *See*—
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Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. 1,2,4-Triazines. 4,467,087, Cl. 544-182.000.

Dusa, Donald J.; and Wagenknecht, Conrad D., to General Electric Company. Nacelle installation. 4,466,587, Cl. 244-121.000.

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Dvorak, Edwin A.; Nagy, George, Jr.; Puscasu, Boris; and Pniewski, Gary A., to Ford Motor Company. Liquid level sensor switch. 4,467,156, Cl. 200-84.00R.

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Dyfverman, Tomas. Apparatus for listing cinematographic film. 4,466,714, Cl. 352-129.000.

Dynamelt Limited: *See*—
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Eby, John C., Jr.; Cauthron, David L.; Ludeman, Michael M.; and Hicks, James R., to Recognition Equipment Incorporated. Video format unit. 4,467,354, Cl. 358-133.000.

Eckels, Robert E. Hydraulic weeder. 4,466,490, Cl. 171-50.000.

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Ehrenwald, Jerry; and Miller, Carl B., Jr., to Ehrenwald, Jerry. Method and apparatus for laser engraving diamonds with permanent identification markings. 4,467,172, Cl. 219-121.0LH.
Eian, Gilbert L.; and Trend, John E., to Minnesota Mining and Manufacturing Company. Imaging process and article employing photolabile, blocked surfactant. 4,467,022, Cl. 430-17.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Method for fabricating a one-time electrically activated switch. 4,466,850, Cl. 156-276.000.
Eichhorn, Winfried; and Eclercy, Kurt, to International Standard Electrik Corporation. Direct-current machine. 4,467,232, Cl. 310-154.000.
Eichmann, Jean E., to Weick, Heinz Hermann. Casing for a watch to be worn on the body. 4,466,745, Cl. 368-281.000.
Eickemeyer, Daniel B.; Rausch, Maurice K.; and Tollefsen, Gerald E., to Atlantic Richfield Company. Needle coke process and product. 4,466,883, Cl. 208-50.000.
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Fathauer, George H.; and Williamson, Warren L., to Masco Corporation of Indiana. Microprocessor-based cordless telephone system. 4,467,140, Cl. 179-2.0EA.

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Feigenbaum, Haim, to Engelhard Corporation. Fuel cell with electrolyte feed system. 4,467,019, Cl. 429-34.000.

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Felker, George A. Condenser filter insert for mufflers for internal combustion engines. 4,466,816, Cl. 55-267.000.

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Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Knock-down drawer assembly. 4,466,675, Cl. 312-263.000.

Ferguson, John H., Jr.; and Angle, Richard O. Scragg mill. 4,466,321, Cl. 83-435.100.

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Finaz, Gilles; Michon, Robert; and Rasclard, Michel, to Societe d'Application et de Developpement de Techniques Nouvelles, S.A.D.E.V. Method of producing a cellular resin suitable for use as an insulating material. 4,467,051, Cl. 521-77.000.

Finnegan, Charles L. Loose leaf holder. 4,466,639, Cl. 281-45.000.

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Fischer, Karl; and Schreder, Felix, to Fischer, Karl. Electric hotplate. 4,467,181, Cl. 219-451.000.

Fischer, Max. Retaining device for axially retaining a pin, shaft or the like. 4,466,763, Cl. 411-521.000.

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Fischer, Rolf: *See*—
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Fletcher, Robert A., to Shell Oil Company. Production of ignition-retardant polymers. 4,467,066, Cl. 524-371.000.

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Gable, Stewart V.; Glover, Robert N.; King, Francis G.; and Meier, Raymond C., Jr., 4,466,279, Cl. 73-117.000.
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Nilsson, Nils A., 4,466,676, Cl. 312-283.000.

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Wilson, John E.; and Polcer, John, 4,466,481, Cl. 165-70.000.

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Frick, Roger L., to Rosemount Inc. Apparatus for conveying fluid pressures to a differential pressure transducer. 4,466,290, Cl. 73-756.000.

Friedrich, John P., to United States of America, Agriculture. Supercritical CO_2 extraction of lipids from lipid-containing materials. 4,466,923, Cl. 260-412.400.

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Dreier, Ernst, 4,466,369, Cl. 112-237.000.

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Mueller, Mark W.; Parker, Thomas S.; Benignus, Douglas M.; and Frye, James L., 4,467,445, Cl. 364-900.000.

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Aoki, Kenzo, 4,466,247, Cl. 60-602.000.
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Fuji Photo Film Co., Ltd.: *See*—
Kato, Toshihiro, 4,467,215, Cl. 250-571.000.
Kobayashi, Kazuhiko; Kito, Eiichi; Watase, Nobuo; and Uchiyama, Kaoru, 4,466,316, Cl. 83-13.000.
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Ohara, Yuji; and Ohnishi, Masahiro, 4,467,367, Cl. 358-298.000.
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Fujikawa, Takao: *See*—
Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, 4,467,185, Cl. 219-539.000.
Fujimoto, Hideyuki: *See*—
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Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,467,432, Cl. 364-474.000.
Inaba, Hajimu; Nakajima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, 4,466,769, Cl. 414-744.00R.
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Kurosu, Hirohiko; Nagata, Satoshi; and Satake, Yasuo, 4,467,454, Cl. 365-189.000.
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Fung, Shun C., to Exxon Research and Engineering Co. Redispersion of Ir catalysts by low temperature reduction step. 4,467,045, Cl. 502-35.000.
Furst, Arpad; Biesert, Horst; and Kohlpaintner, Georg, to Webasto-Werk W. Baier GmbH & Co. Crank drive. 4,466,658, Cl. 296-223.000.
Furukawa Electric Co., Ltd., The: *See*—
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Furukawa, Yuji: *See*—
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Futamoto, Masaaki; Yuito, Isamu; and Kawabe, Ushio, to Hitachi, Ltd. Ion beam source. 4,467,240, Cl. 313-336.000.
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Gable, Stewart V.; Glover, Robert N.; King, Francis G.; and Meier, Raymond C., Jr., to Ford Motor Company. Automated manual transmission shifter. 4,466,279, Cl. 73-117.000.
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Grant, John L.; Torti, Emanuel D.; O'Malley, Austin S.; Galligan, Thomas W.; and DelPrete, Stephen D., 4,466,684, Cl. 339-176.00M.
Gamo, Gotaro; and Kinoshita, Mitsuo, to Fanuc Ltd. Wire-cut electric discharge machining control method. 4,467,166, Cl. 219-69.00W.
Ganellin, Charon R.: *See*—
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Gang-Nail Systems, Inc.: *See*—
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Gantz, William O. Emergency signalling device. 4,466,698, Cl. 350-99.000.
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Leuthold, Karl; Mitzel, Wilhelm; and Haberstroh, Markus, 4,466,605, Cl. 271-177.000.
Maurer, Thomas; Lob, Erwin; and Schweiger, Peter, 4,467,209, Cl. 235-487.000.
Gardner, Edward B.; and Winzer, Frederick W., to Emhart Industries, Inc. Apparatus and method for controlling the shears of a glassware forming machine. 4,467,431, Cl. 364-473.000.
Gardner, Robert M.; and Thompson, Ronald L., to GKN Forgings Limited. Forging apparatus. 4,466,266, Cl. 72-357.000.
Gardner, Timothy P. Finger tip operated tab top beverage container opener. 4,466,313, Cl. 81-3.46R.
Garner, Lloyd L.; Westfall, Samuel R.; and Rife, Dwight A., to Rock Bit Industries U.S.A., Inc. Rotary drill bit multiple seal assembly. 4,466,621, Cl. 277-84.000.
Garnett, Donald W., to Olofsson Corporation, The. Lead screw overthrust protection. 4,466,511, Cl. 188-134.000.
Garrison, Melton E., to United States of America, Energy. Method for braze-joining spirally wound tapes to inner walls of heat exchanger tubes. 4,466,567, Cl. 228-183.000.
Gauvin, William H.; and Kubanek, George R., to Noranda Mines Limited. Transferred-arc plasma reactor for chemical and metallurgical applications. 4,466,824, Cl. 75-10.00R.
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Gelman Sciences Inc.: *See*—
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Gemelli, Carlo. Garlic squeezer, provided with means for removing the squeezed cloves. 4,466,346, Cl. 100-112.000.
General Dynamics, Pomona Division: *See*—
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General Electric Company: *See*—
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Bergh, Daniel D.; Koch, Robert E.; and Timoshenko, John A., 4,467,387, Cl. 361-132.000.
Blake, Charles R.; and Mullersman, Ferdinand H., 4,467,264, Cl. 320-2.000.
Bloomer, Milton D.; and Martzloff, Francois D., 4,467,245, Cl. 315-75.000.
Collin, Edwin J.; and Jencks, Charles L., 4,467,299, Cl. 335-20.000.
Dieck, Ronald L.; and Wambach, Allen D., 4,467,057, Cl. 523-212.000.
Dusa, Donald J.; and Wagenknecht, Conrad D., 4,466,587, Cl. 244-121.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,466,850, Cl. 156-276.000.
Gigl, Paul D.; and Winegardner, Robert L., 4,466,938, Cl. 264-332.000.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,466,929, Cl. 264-1.200.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., 4,466,930, Cl. 264-1.200.
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Peroutky, Donald C., 4,466,770, Cl. 414-751.000.
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Genter, Melvyn E.: *See*—
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Geren, Henrietta C., administratrix: *See*—
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Gerlach, Leroy E.: *See*—
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Geromiller, Oswald, to Optimol-Olwerke GmbH, bH 03. Apparatus for testing lubricating and material properties. 4,466,271, Cl. 73-10.000.
Gess, Larry C., to L. C. Gess, Inc. Method and apparatus for producing packages from cohesive-coated media. 4,466,228, Cl. 53-553.000.
Gessalin, Jean, to G.P.A. International. Safety helmet with a shell injected from thermoplastics and method for the manufacture of said helmet. 4,466,138, Cl. 2-243.00R.
Giandenoto, Frank J.; and Saiia, Anthony J., to Textron Inc. Tractor seat-operated hydraulic valve control. 4,466,504, Cl. 180-273.000.
Gianni, Richard F., to Biosafety Systems, Inc. Hypodermic needle disposal system. 4,466,538, Cl. 206-366.000.
Giannis, Peter M.; and Coy, Don R., Jr., to T/B & H Home Video. Cassette door latch. 4,466,583, Cl. 242-198.000.
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, to Bayer Aktiengesellschaft. Glycidyl-1,2,4-triazolidine-3,5-diones. 4,467,099, Cl. 548-264.000.
Gigl, Paul D.; and Winegardner, Robert L., to General Electric Company. Method for reducing damage to diamond crystals during sintering. 4,466,938, Cl. 264-332.000.
Gigliotti, Guiseppe; and Roul, Jean-Michel, to Roussel Uclaf. Process for the preparation of 3-methyl-3-hydroxy-glutaric acid. 4,467,108, Cl. 560-180.000.
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Gillery, F. Howard, to PPG Industries, Inc. Auxiliary heater for magnetron sputtering. 4,466,875, Cl. 204-192.00R.
Gilliland, Malcolm T. Remote control of open circuit voltage in a welding power supply. 4,467,174, Cl. 219-132.000.
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Givaudan Corporation: *See*—
Chalk, Alan J.; Magennis, Steven A.; Wertheimer, Vasile S.; and Naipawer, Richard E., 4,467,118, Cl. 568-687.000.
GK Technologies, Inc.: *See*—
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GKN Forgings Limited: *See*—
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Glaxo Group Limited: *See*—
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Said, Adil S.; and Schober, Antonio, 4,466,453, Cl. 133-3.00C.
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Gable, Stewart V.; Glover, Robert N.; King, Francis G.; and Meier, Raymond C., Jr., 4,466,279, Cl. 73-117.000.
Go, Ting S. L.; and Wilson, George R., III, to Atlantic Richfield Company. Aklylation aid for sulfuric acid catalyzed alkylation units. 4,467,132, Cl. 585-724.000.
Goddin, Clifton S., Jr.; Turek, Edward A.; and George, Boyd A., to Standard Oil Company (Indiana). CO_2 Removal from high CO_2 content hydrocarbon containing streams. 4,466,946, Cl. 423-228.000.
Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., to Von Duprin, Inc. Dogging device, method of forming the same, and an adapter kit therefor. 4,466,643, Cl. 292-92.000.
Godijn, Willem, to Research Instituut Sesto B.V. Liquid-fuel pot burner. 4,466,790, Cl. 431-337.000.
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Goebel, Jorg: *See*—
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Gollub, Hans J.: *See*—
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Good, William K., to Koppy Corporation. Method of forming a thin walled annular channel. 4,466,566, Cl. 228-155.000.
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Goodrich, Ronald W., to Essex Group, Inc. Electric switch having enhanced fault current capability. 4,467,301, Cl. 335-195.000.
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Gordon, Jack J. Reflector for spoked wheel. 4,467,404, Cl. 362-346.000.
Gordy, Wade T., to United States of America, Energy. Circuit breaker lock out assembly. 4,467,152, Cl. 200-42.00T.
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Goto, Kenji: *See*—
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Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,466,258, Cl. 68-5.00C.
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, to EVG Entwicklungs-und Verwertungs-Gesellschaft m.b.H. Power transmission. 4,466,304, Cl. 74-346.000.
Gottlieb, Robert G. Sled structure with runner connecting transverse link. 4,466,627, Cl. 280-21.00A.
Gould, H. Daniel, to Shasta Industries, Inc. Pool cleaning head with rotary pop-up jet producing element. 4,466,142, Cl. 4-490.000.
Gould Inc.: *See*—
St. Germain, Ronald E.; and Zdinak, Paul, 4,466,679, Cl. 339-44.00M.
Gounder, Raj N.; and Geary, John T., to Lord Corporation. Epoxy resin compositions cured with imide-amine at ambient temperatures to afford products having useful properties at high temperatures. 4,467,100, Cl. 548-429.000.
Grace, Fred I., to United States of America, Army. High velocity jet shaped charge. 4,466,353, Cl. 102-307.000.
Gradco Systems, Inc.: *See*—
DuBois, R. Clark; and Hamma, John C., 4,466,608, Cl. 271-293.000.
Lawrence, Frederick J., 4,466,609, Cl. 271-293.000.
Gradl, Reinhard: *See*—
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,466,948, Cl. 423-321.00R.
Grain Processing Corporation: *See*—
Pedersen, Lee C.; and Elmquist, Lyle F., 4,467,012, Cl. 428-248.000.
Granberg, Elof, to Granberg Pump & Meter Ltd. Traction device. 4,466,427, Cl. 128-71.000.
Granberg Pump & Meter Ltd.: *See*—
Granberg, Elof, 4,466,427, Cl. 128-71.000.
Grant, John L.; Torti, Emanuel D.; O'Malley, Austin S.; Galligan, Thomas W.; and DelPrete, Stephen D., to Texas Instruments Incorporated. Low insertion force connector. 4,466,684, Cl. 339-176.00M.
Grant, Norman H.: *See*—
Hjorth, Richard N.; Moore, Bobby O.; and Grant, Norman H., 4,466,957, Cl. 424-89.000.
Grantham, Daniel H.; and Swindal, James L., to United Technologies Corporation. Three plate silicon-glass-silicon capacitive pressure transducer. 4,467,394, Cl. 361-283.000.
Grave, Dale L. Recycling cleaning apparatus. 4,466,155, Cl. 15-321.000.
Gray, Thomas J., to Olin Corporation. Electrolytic cell with improved hydrogen evolution cathode. 4,466,868, Cl. 204-95.000.
Great Lakes Carbon Corporation: *See*—
Prescott, Roger, 4,466,997, Cl. 427-140.000.
Greene, Roger E.: *See*—
Sprecker, Mark A.; Belko, Robert P.; and Greene, Roger E., 4,466,908, Cl. 252-522.00R.
Greer, S. Thomas: *See*—
Barch, Herbert W.; Martin, Emil; and Greer, S. Thomas, 4,466,151, Cl. 15-209.00D.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., to General Electric Company. Preparation of yttria-gadolinia ceramic scintillators by vacuum hot pressing. 4,466,929, Cl. 264-1.200.
Greskovich, Charles D.; Cusano, Dominic A.; and DiBianca, Frank A., to General Electric Company. Preparation of yttria-gadolinia ceramic scintillators by vacuum hot pressing. 4,466,930, Cl. 264-1.200.
Griego, Arthur G.; Griego, Randy T.; and Griego, George A., Jr. Target apparatus. 4,466,616, Cl. 273-384.000.
Griego, George A., Jr.: *See*—
Griego, Arthur G.; Griego, Randy T.; and Griego, George A., Jr., 4,466,616, Cl. 273-384.000.
Griego, Randy T.: *See*—
Griego, Arthur G.; Griego, Randy T.; and Griego, George A., Jr., 4,466,616, Cl. 273-384.000.

Grinberg, Jan: *See*—
Wiener-Avnear, Eliezer; and Grinberg, Jan, 4,466,702, Cl. 350-347.00R.

Grissom, Donald L.: *See*—
Jones, Arnold H.; and Grissom, Donald L., 4,467,153, Cl. 200-61.45R.

Gritton, Charles W. K., to AT&T Bell Laboratories. Adaptive filter including controlled tap coefficient leakage. 4,467,441, Cl. 364-724.000.

GRM Industries, Inc.: *See*—
Summers, Larry E., 4,466,449, Cl. 131-237.000.

Grogan, Dennis R. Fume hood energy controller. 4,466,341, Cl. 98-115.0LH.

Gross, Anthony E., to Nalco Chemical Company. Polymer collectors for coal flotation. 4,466,887, Cl. 209-166.000.

Gross, Thomas A. O.; Lalumiere, Edward; and Arzberger, William A., to Jet Spray Corp. Timer with touch control. 4,467,222, Cl. 307-115.000.

Grossman, Steven J.; and Onder, Kemal, to Upjohn Company, The. Copolyamide-imides. 4,467,083, Cl. 528-49.000.

Grover, Kent B., to Lubrizol Corporation, The. Phosphorus-containing metal salts/sulfurized phenate compositions/aromatic substituted triazoles, concentrates, and functional fluids containing same. 4,466,894, Cl. 252-32.70E.

Grubelich, Matthew J.: *See*—
Davis, Dean I.; Ensz, Lyndon D.; and Grubelich, Matthew J., 4,466,689, Cl. 339-263.00R.

Gruber, Wolfgang: *See*—
Kleinhammer, Gerd; Deutsch, Gerlinde; Linke, Hans-Ralf; Stahler, Fritz; and Gruber, Wolfgang, 4,467,030, Cl. 435-7.000.

Grudzien, Christopher P., Jr.; and DelVecchio, Leonard P., Jr., to Dresser Industries, Inc. Electrical switch apparatus. 4,467,155, Cl. 200-81.00R.

Grynberg, Ami; Perlstein, Abraham; and Gliksman, Edward, to Israel Aircraft Industries Ltd. Apparatus for sensing and locating vibrations. 4,466,288, Cl. 73-654.000.

GTE Automatic Electric Inc.: *See*—
Barzen, Thomas J., 4,467,269, Cl. 323-356.000.
Krikor, Krikor A., 4,467,469, Cl. 370-58.000.

GTE Automatic Electric Labs Inc.: *See*—
Rinaldi, Gerald M., 4,467,285, Cl. 328-112.000.
Van Husen, Hendrik W., 4,467,399, Cl. 361-379.000.

GTE Products Corporation: *See*—
Cheney, Richard F.; and Bansal, Anil, 4,466,945, Cl. 423-53.000.
Dorazio, Raymond E.; Mingos, William L.; and Cleveland, Joseph J., 4,466,482, Cl. 165-145.000.

Guggenbuehler, Max; and Heyland, Sven, to Societe D'Assistance Technique Pour Produits Nestle S.A. Process for the production of a flavoring agent. 4,466,986, Cl. 426-533.000.

Guillard, Michel G.: *See*—
Even, Andre; Fortier, Christian; Guillard, Michel G.; Hedoin, Dominique; Le Guen, Serge; and Raucourt, Dominique, 4,467,430, Cl. 364-436.000.

Gulf Research & Development Company: *See*—
Occelli, Mario L.; and Swift, Harold E., 4,466,884, Cl. 208-120.000.

Gulrich, Leslie W., Jr.: *See*—
Bair, Thomas I.; and Gulrich, Leslie W., Jr., 4,466,935, Cl. 264-184.000.

Gustavsson, Per-Olof G.: *See*—
Charas, Philip M.; Gustavsson, Per-Olof G.; and Morwing, Bo A., 4,467,326, Cl. 343-6.50R.

Guziec, Frank S., Jr., to Thiokol Corporation. 4-Dimethylaminopyridinium chlorochromate as an oxidizing agent for conversion of alcohols to their respective ketones. 4,466,921, Cl. 260-397.300.

GX-Holding AG.: *See*—
Jaeger, Walter, 4,467,376, Cl. 360-84.000.

H. F. Hanscom & Company, Inc.: *See*—
Hanscom, John F., 4,466,227, Cl. 53-528.000.

H. H. Robertson Company: *See*—
Hague, James G., 4,466,224, Cl. 52-478.000.

Haas, Roland: *See*—
Hans, Rudiger; and Haas, Roland, 4,466,503, Cl. 180-259.000.

Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, to BASF Aktiengesellschaft. Production of blue iron hexacyanoferrate-III pigments. 4,466,867, Cl. 204-91.000.

Haberstroh, Markus: *See*—
Leuthold, Karl; Mitzel, Wilhelm; and Haberstroh, Markus, 4,466,605, Cl. 271-177.000.

Hacker, Philip S., to Westinghouse Electric Corp. Radar jammer with an antenna array of pseudo-randomly spaced radiating elements. 4,467,328, Cl. 343-18.00E.

Hadani, Yitzhak, to Hadani, Yitzhak. Night-vision equipment. 4,467,190, Cl. 250-213.0VT.

Hadd, Harry E., to Indiana University Foundation. Compositions and process for the treatment of cancer. 4,466,952, Cl. 424-1.100.

Haemonetics Corporation: *See*—
Verkaart, Wesley H., 4,466,888, Cl. 210-232.000.

Hafner, Hans W., to Pfister GmbH. Device for measuring a force. 4,466,297, Cl. 73-862.640.

Hague, James G., to H. H. Robertson Company. Two-piece attachment clip for insulated roof or wall structure. 4,466,224, Cl. 52-478.000.

Haller, Albert H.; and Schutz, Eckart F., to AT&T Technologies, Inc. Horizontal mobility in fluidized beds. 4,466,989, Cl. 427-185.000.

Halliburton Company: *See*—
Briscoe, James E., 4,466,890, Cl. 252-8.55R.
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., 4,466,837, Cl. 106-85.000.
Dill, Walter R., 4,466,893, Cl. 252-8.55C.
Murphey, Joseph R., 4,466,831, Cl. 106-74.000.
Shelton, Robert Q., 4,466,572, Cl. 239-186.000.

Hamada, Masato; Ohmura, Jukichi; and Muranaka, Fumio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of (ω-fluorosulfonyl)haloaliphatic carboxylic acid fluorides. 4,466,881, Cl. 204-59.00F.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Tsuchiya, Yutaka, 4,467,189, Cl. 250-213.0VT.

Hamamatu, Takashi: *See*—
Hatta, Tokuaki; Ueno, Haruyuki; Katsura, Yuji; Fukuda, Kazushige; Kubota, Hiroshi; and Hamamatu, Takashi, 4,467,042, Cl. 501-88.000.

Hamma, John C.: *See*—
DuBois, R. Clark; and Hamma, John C., 4,466,608, Cl. 271-293.000.

Hammer, Edward E., to General Electric Company. High frequency fluorescent lamp circuit. 4,467,247, Cl. 315-189.000.

Hammes, Peter: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.

Hammond, Hilton H.: *See*—
Brane, Earl P.; Brane, Douglas K.; and Hammond, Hilton H., 4,466,457, Cl. 137-599.100.

Han, Byung-Hee: *See*—
Boudjouk, Philip R.; and Han, Byung-Hee, 4,466,870, Cl. 204-158.00S.

Hanacek, William A.; and Bickel, Paul, to Bud Antle, Inc. Singulating seeder for high density plug trays. 4,466,554, Cl. 221-1.000.

Hanaway, Roger D., to Allis-Chalmers Corporation. Harvester grain bin with foldable extensions. 4,466,549, Cl. 220-4.00A.

Hanazato, Hiroshi, to Buddy L Corporation. Miniature toy vehicle assembly. 4,466,215, Cl. 446-469.000.

Hancock, Robert D.; and Holliman, Kenneth F., to Hancock, Robert D. Ebulliometric hot spot detector. 4,466,746, Cl. 374-5.000.

Handa, Noritoshi, to Nissan Motor Company, Limited. Combustion type heater for automotive room heating system. 4,466,568, Cl. 237-12.30C.

Hang, Kenneth W.: *See*—
Prabhu, Ashok N.; and Hang, Kenneth W., 4,467,009, Cl. 428-210.000.

Haniisuchiiru Co., Ltd.: *See*—
Hirotsu, Toshiaki, 4,466,366, Cl. 112-79.00R.

Hanko, Leonard: *See*—
Davis, Steven J.; and Hanko, Leonard, 4,467,474, Cl. 372-89.000.

Hannes Marker GmbH & Co. Vertriebs K.G.: *See*—
Marker, Hannes, 4,466,375, Cl. 114-90.000.

Hans, Rudiger; and Haas, Roland, to SKF Kugellagerfabriken GmbH. Bearing assembly for the driven wheel of a vehicle. 4,466,503, Cl. 180-259.000.

Hans Schwarzkopf GmbH: *See*—
Heeb, Dieter; Bechmann, Gunter; Bergemann, Uwe; Bollert, Volker; and Frenzel, Claus-Dieter, 4,466,838, Cl. 106-311.000.

Hanscom, John F., to H. F. Hanscom & Company, Inc. Machine for wrapping tape about an article. 4,466,227, Cl. 53-528.000.

Hanselmann, Gerd: *See*—
Loscher, Lothar W.; Hoogeveen, Frank; and Hanselmann, Gerd, 4,466,429, Cl. 128-92.00E.

Hansen, Gary P., to Red Dot Corporation. Programmable multiport switch. 4,466,456, Cl. 137-596.200.

Hanson, Charles B., to J. I. Case Company. Implement with gripping arm assembly for a backhoe. 4,466,494, Cl. 173-46.000.

Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, to Janome Sewing Machine Co. Ltd. Lock stitching sewing machine with a thread tightening device. 4,466,368, Cl. 112-191.000.

Hanyu, Susumu: *See*—
Eguchi, Yasukata; and Hanyu, Susumu, 4,466,370, Cl. 112-269.100.

Hanzawa, Kohtaro: *See*—
Sano, Shigenori; and Hanzawa, Kohtaro, 4,467,440, Cl. 364-724.000.

Hara, Kazumasa: *See*—
Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,466,368, Cl. 112-191.000.

Haraguchi, Shosuke; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Wind-up device for camera. 4,466,719, Cl. 354-173.110.

Harasaki, Hayathugu, to Toyo Kogyo Co., Ltd. Automobile front body structure. 4,466,653, Cl. 296-189.000.

Harasawa, Isamu; Hariki, Yukio; Maeda, Katsuhiko; and Nakamura, Koichi, to Nippon Carbide Kogyo Kabushiki Kaisha. Cultivation of phototrophic bacteria in the absence of ultraviolet light. 4,467,035, Cl. 435-253.000.

Harbauer, Werner, to Siemens Aktiengesellschaft. Electromagnetic switching apparatus. 4,467,300, Cl. 335-131.000.

Harco Corporation: *See*—
Bushman, James B.; Weldon, Clark P.; and Wolfson, Stephen L., 4,467,274, Cl. 324-71.100.

Hariki, Yukio: *See*—
Harasawa, Isamu; Hariki, Yukio; Maeda, Katsuhiko; and Nakamura, Koichi, 4,467,035, Cl. 435-253.000.

Harja, Arne M., to Sundstrand Data Control, Inc., unit of Sundstrand Corporation. Tape recorder head moving mechanism. 4,467,381, Cl. 360-106.000.

Harlock, Sally-Jane: *See*—
Tharrat, John; and Harlock, Sally-Jane, 4,466,431, Cl. 128-156.000.

Harmon, William J., Jr.; and Mick, John R., to Advanced Micro Devices, Inc. Processor unit for microcomputer systems. 4,467,444, Cl. 364-900.000.

Harris Corporation: *See*—
Kasten, Alan J., 4,466,179, Cl. 29-576.00T.

Harris, John C.: *See*—
DiNitto, Robert G.; Harris, John C.; and Maciel, Robert F., 4,466,878, Cl. 204-415.000.

Harris, Richard H., to International Business Machines Corporation. Nutating snap action switch mechanism. 4,466,302, Cl. 74-100.00R.

Harris, Robert W.: *See*—
Napoli, Phillip D.; Harris, Robert W.; and Brisken, Thomas A., 4,466,239, Cl. 60-39.020.

Harte, Kenneth J.: *See*—
Smith, Donald O.; and Harte, Kenneth J., 4,467,211, Cl. 250-492.200.

Hartman, Adrian R.: *See*—
Chang, Gee-Kung; Hartman, Adrian R.; and Weston, Harry T., 4,467,344, Cl. 357-39.000.

Hartmann, Werner; and Kusters, Eduard, to Kusters, Eduard. Machine for the manufacture of molded bodies. 4,466,853, Cl. 156-381.000.

Hartung, Erwin; Klenk, Martin; and Moller, Heinz, to Robert Bosch GmbH. Regulating device for control variables of an internal combustion engine. 4,466,406, Cl. 123-425.000.

Hasegawa Chemical Industry Co., Ltd.: *See*—
Hasegawa, Shigezi; Yamaguchi, Tadashige; Hasegawa, Yatsuhiro; and Hasegawa, Shigekazu, 4,467,006, Cl. 428-137.000.

Hasegawa, Shigekazu: *See*—
Hasegawa, Shigezi; Yamaguchi, Tadashige; Hasegawa, Yatsuhiro; and Hasegawa, Shigekazu, 4,467,006, Cl. 428-137.000.

Hasegawa, Shigezi; Yamaguchi, Tadashige; Hasegawa, Yatsuhiro; and Hasegawa, Shigekazu, to Hasegawa Chemical Industry Co., Ltd. Woven reinforcement for plastic. 4,467,006, Cl. 428-137.000.

Hasegawa, Shumpei; and Nakajima, Toyohei, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio feedback control method for internal combustion engines. 4,466,411, Cl. 123-480.000.

Hasegawa, Wataru; and Ishikawa, Katsuji, to West Electric Company, Ltd. Apparatus and method for transmitting ultrasonic wave. 4,467,362, Cl. 358-227.000.

Hasegawa, Yatsuhiro: *See*—
Hasegawa, Shigezi; Yamaguchi, Tadashige; Hasegawa, Yatsuhiro; and Hasegawa, Shigekazu, 4,467,006, Cl. 428-137.000.

Hasher, Steve J.: *See*—
Calvo, Luis C.; Obernier, Irene C.; and Hasher, Steve J., 4,466,955, Cl. 424-62.000.

Hashimoto, Akihiko, to Olympus Optical Co., Ltd. Focal-plane shutter. 4,466,720, Cl. 354-244.000.

Hashimoto, Kazuhiko: *See*—
Saito, Shozo; Uchida, Yukimasa; Hashimoto, Kazuhiko; and Endo, Norio, 4,467,452, Cl. 365-184.000.

Hashimoto, Shigeru: *See*—
Kato, Masatake; and Hashimoto, Shigeru, 4,466,710, Cl. 350-464.000.

Haslanger, Martin F.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,466,979, Cl. 424-285.000.

Hassenfritz, Dave. Planter attachment. 4,466,364, Cl. 111-1.000.

Hassler, Albin; and Friz, Eckehart, to Robert Bosch GmbH. Circuit for measuring inductance changes. 4,467,272, Cl. 324-59.000.

Hastings, Lynford. Apparatus and method for exposing a sensitized base. 4,466,737, Cl. 355-84.000.

Hata, Seiji; Terabayashi, Takao; Arakawa, Noriyoshi; and Watanabe, Makoto, to Hitachi, Ltd. Electron beam drilling apparatus. 4,467,170, Cl. 219-121.0EH.

Hatagishi, Shingo, to Yoshida Kogyo K.K. Method and apparatus for feeding sliders to slider pocket for assembling sliders on an uncut fastener chain. 4,466,168, Cl. 29-409.000.

Hatotani, Hisashi: *See*—
Takaishi, Tetsuo; Itabashi, Keiji; Morishita, Satoru; and Hatotani, Hisashi, 4,466,812, Cl. 55-68.000.

Hatta, Tokuaki; Ueno, Haruyuki; Katsura, Yuji; Fukuda, Kazushige; Kubota, Hiroshi; and Hamamatu, Takashi, to Kurosaki Refractories Co., Ltd. Refractories with flaky β-silicon carbide. 4,467,042, Cl. 501-88.000.

Hattori, Masayuki; and Nakamura, Shigeo, to Fanuc Ltd. Ringing converter. 4,467,406, Cl. 363-19.000.

Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Feedback type ignition timing control system for internal combustion engines. 4,466,405, Cl. 123-416.000.

Hattori, Yoshiyuki; Matsui, Kazuma; Takei, Toshihiro; Hayakawa, Hideyuki; and Goshima, Takahiro, to Nippondenso Co., Ltd. Electric control system for automobile transmission. 4,466,521, Cl. 192-0.032.

Haury, Andre : *See*—
Belbel, Elie; Fechant, Louis; Haury, Andre ; Lauraire, Michel; and Siffroi, Lucien, 4,467,298, Cl. 335-16.000.

Hawerkamp, Manfred. Method and device for producing a helically wound tube. 4,466,854, Cl. 156-429.000.

Hayakawa, Hideyuki: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; Takei, Toshihiro; Hayakawa, Hideyuki; and Goshima, Takahiro, 4,466,521, Cl. 192-0.032.

Hayashi, Mineo, to Nippon Electric Co., Ltd. Semiconductor integrated circuit. 4,467,449, Cl. 365-51.000.

Hayden, Thomas D.: *See*—
Dodson, Vance H.; and Hayden, Thomas D., 4,466,834, Cl. 106-89.000.

Hayward, Gamon B., to Maas-Rowe Carillons, Inc. Handbell. 4,466,329, Cl. 84-406.000.

Hazato, Atsuo: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.

Hazen, George G.; and Volante, Ralph P., to Merck & Co., Inc. Process for the conversion of primary and secondary alcohols to their corresponding thiols and thiol esters. 4,466,914, Cl. 260-239.00A.

Hazet-Werk Hermann Zerver GmbH & Co. K.G.: *See*—
Zerver, Alfred, 4,466,628, Cl. 280-47.350.

Hechenberger, Dieter A.; and Gollub, Hans J., to Lingner & Fischer GmbH. Curing compositions containing redox indicators. 4,467,079, Cl. 526-90.000.

Hecox, Spencer S.: *See*—
Bacon, Duane E.; and Hecox, Spencer S., 4,466,864, Cl. 204-15.000.

HED Corporation: *See*—
Wohlwend, Maurice, 4,466,493, Cl. 173-19.000.

Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,467,121, Cl. 568-726.000.

Hedges, Richard A.; Shockley, David L.; Fralick, Stanley C.; and Kane, Paul H. Remote gaming system. 4,467,424, Cl. 364-412.000.

Hedoin, Dominique: *See*—
Even, Andre; Fortier, Christian; Guillard, Michel G.; Hedoin, Dominique; Le Guen, Serge; and Raucourt, Dominique, 4,467,430, Cl. 364-436.000.

Heeb, Dieter; Bechmann, Gunter; Bergemann, Uwe; Bollert, Volker; and Frenzel, Claus-Dieter, to Hans Schwarzkopf GmbH. Pressurized carrier mixture for aerosol preparations. 4,466,838, Cl. 106-311.000.

Heilman, Robert R.; and McElroy, Howard J., to Lockformer Company, The; and Iowa Precision Industries, Inc. Duct connecting system. 4,466,641, Cl. 285-406.000.

Heinemann, Otto; Heiringhoff, Burkhard; Lucke, Helmut; Schossler, Werner; and Krumme, Helmut, to Krupp Polysius AG. Bearing segment for a sliding shoe. 4,466,750, Cl. 384-117.000.

Heinz, Focke; and Liedtke, Kurt, to Focke & Co. Process and apparatus for feeding successive webs of packaging material. 4,466,577, Cl. 242-58.000.

Heiringhoff, Burkhard: *See*—
Heinemann, Otto; Heiringhoff, Burkhard; Lucke, Helmut; Schossler, Werner; and Krumme, Helmut, 4,466,750, Cl. 384-117.000.

Held, Kurt. Method for the continuous production of laminates. 4,466,847, Cl. 156-166.000.

Helix Technology Corporation: *See*—
Chellis, Fred F., deceased; and Lessard, Philip A., 4,466,251, Cl. 62-6.000.

Hempy, Harry O.: *See*—
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,467,411, Cl. 364-200.000.

Hendrickx, Johannes W. J., to Vredestein N.W. Web or sheet fastened to an article. 4,466,472, Cl. 152-349.000.

Henery, Maurice D.; Kerwin, John M.; and Walker, Walter W., to Marblehead Lime Company. Method and apparatus for waste incineration. 4,466,361, Cl. 110-346.000.

Heng, Jean P.: *See*—
Jusseau, Marcel; Borne, Andre ; Fermond, Gilbert; and Heng, Jean P., 4,466,682, Cl. 339-97.00R.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Lauermann, Georg; Scholz, Siegfried; and Koch, Ferdinand, 4,466,959, Cl. 424-150.000.

Henley, James C. Articulated vehicle. 4,466,633, Cl. 280-492.000.

Henry, William F.: *See*—
Eggleton, Cecil H.; and Henry, William F., 4,466,598, Cl. 254-358.000.

Hepfer, Rolf; and Runzler, Jurgen, to Joseph Kieninger GmbH & Co. KG. Striking clock including device for selectively and/or temporarily preventing the gong or bell from being struck. 4,466,744, Cl. 368-262.000.

Heraeus Quarzschmelze GmbH: *See*—
Christiansen, Uwe; Rau, Karlheinz; and Simmat, Fritz, 4,466,700, Cl. 350-310.000.

Herberg, Helmut, to Siemens Aktiengesellschaft. Thyristor with a multi-layer semiconductor body with a pnpn layer sequence and a method for its manufacture with a {111} lateral edge bevelling. 4,467,343, Cl. 357-38.000.

Herbert, James F., to Metal Closures Limited. Container and closure and method for applying a closure to a container. 4,466,548, Cl. 215-307.000.

Herbort, Hans-Joachim; and Schuster, Heinz G., to UHDE GmbH. Process and apparatus for conditioning saliferous atmospheric intake air. 4,466,814, Cl. 55-90.000.

Herman, Richard L., to International Business Machines Corporation. Self-contained clutch useful for single revolution applications. 4,466,520, Cl. 192-28.000.

Herzog, Klaus, to Carl-Zeiss-Stiftung. Measuring machine of the portal variety. 4,466,195, Cl. 33-174.00L.

Hewlett Packard Company: *See*—
Batey, Robert M.; and Petroski, Peter J., 4,467,374, Cl. 360-46.000.
Maeda, Koichi; and Ito, Haruo, 4,467,275, Cl. 324-73.0AT.
Heyland, Sven: *See*—
Guggenbuehler, Max; and Heyland, Sven, 4,466,986, Cl. 426-533.000.
Heymer, Gero: *See*—
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,466,948, Cl. 423-321.00R.
Hicks, James R.: *See*—
Eby, John C., Jr.; Cauthron, David L.; Ludeman, Michael M.; and Hicks, James R., 4,467,354, Cl. 358-133.000.
Hida, Takashi; Takayama, Katsuki; and Kuwana, Kazutaka, to Aisin Seiki Kabushiki Kaisha. Air lumbar support. 4,467,426, Cl. 364-424.000.
Hierholzer, Alton G., Jr., to Wide-Lite International Corporation. Battery charger. 4,467,265, Cl. 320-17.000.
Higgins, Godfrey A., to Compair Maxam Limited. Pneumatic timer with spiral throttle. 4,466,459, Cl. 137-624.110.
Higuchi, Seiji, to Nippin Seiko Kabushiki Kaisha. Combined bearing. 4,466,751, Cl. 384-126.000.
Hill, Clinton W., to U. S. Plastics Corporation. Gravity switch and method of making same. 4,467,154, Cl. 200-61.45R.
Hill, John O. Cable holder. 4,466,581, Cl. 242-96.000.
Hill, Johnny E. Low profile pumpjack unit. 4,466,301, Cl. 74-41.000.
Hill, Richard J.: *See*—
Belke, Robert E., Jr.; Hill, Richard J.; Shirk, Raymond A.; and Smith, David P., 4,466,874, Cl. 204-192.0EC.
Hilmann, Juergen; Hoffmann, Rolf-Ruediger; Muetzel, Wolfgang; and Zimmermann, Ingfried, to Schering Aktiengesellschaft. Carrier liquid solutions for the production of gas microbubbles, preparation thereof, and use thereof as contrast medium for ultrasonic diagnostics. 4,466,442, Cl. 128-653.000.
Hines, William A., to Owens-Illinois, Inc. CRT With magnetic shield. 4,467,241, Cl. 313-402.000.
Hiniker Company: *See*—
Steinberg, Richard W., 4,466,492, Cl. 172-551.000.
Hinkens, Dale R.: *See*—
Morgan, George M.; and Hinkens, Dale R., 4,467,168, Cl. 219-121.0LG.
Hino, Tsunekazu. Extracorporeal circulation of blood. 4,466,804, Cl. 604-4.000.
Hinterreiter, Ignaz; and Neumuller, Walter. Holding body to attach a sealing foil of synthetic material to a foundation. 4,466,758, Cl. 405-150.000.
Hinton, E. Louis. Gas driven music box. 4,466,327, Cl. 84-95.00C.
Hinz, Bernhard; and Kochendorfer, Richard, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Piston-cylinder set for reciprocating internal-combustion engines, especially Otto and diesel engines. 4,466,399, Cl. 123-193.0CP.
Hiraga, Masaharu, to Sanden Corporation. Drive mechanism for a scroll type fluid displacement apparatus. 4,466,784, Cl. 418-55.000.
Hiraishi, Shigetoshi, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording sheet. 4,467,338, Cl. 346-209.000.
Hiraiwa, Kazuyoshi; and Fukuda, Yoshiyuki, to Nissan Motor Co., Ltd. Reverse idler gear operating mechanism. 4,466,305, Cl. 74-473.00R.
Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Slip control system for a clutch. 4,466,311, Cl. 74-866.000.
Hirano, Toshio: *See*—
Saito, Takashi; and Hirano, Toshio, 4,467,465, Cl. 369-77.200.
Hiraoka, Takeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, to Nippon Piston Ring Co., Ltd. Cylinder liner. 4,467,169, Cl. 219-121.0EB.
Hirashima, Shigeaki; and Chida, Shintaro, to Niigata Engineering Co., Ltd. Valve unit for use in concrete pumps. 4,466,782, Cl. 417-517.000.
Hirohata, Michio, to Canon Kabushiki Kaisha. Electromagnetic drive device for camera. 4,466,725, Cl. 354-403.000.
Hirohata, Michio: *See*—
Ikari, Hideo; and Hirohata, Michio, 4,466,723, Cl. 354-400.000.
Hirose, Katsutoshi: *See*—
Murase, Isao; and Hirose, Katsutoshi, 4,466,943, Cl. 422-91.000.
Hirotsu, Toshiaki, to Haniisuchiiru Co., Ltd. Method of tufting cut pile and loop pile in the same row of stitching. 4,466,366, Cl. 112-79.00R.
Hirschinger, Lothar: *See*—
Kalwar, Klaus; Freytag, Egon; Hirschinger, Lothar; and Ebner, Klaus, 4,467,200, Cl. 250-324.000.
Hirsh Company: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,466,675, Cl. 312-263.000.
Hitachi, Ltd.: *See*—
Anzai, Masayasu, 4,467,334, Cl. 346-160.000.
Fukushima, Masakazu; Maruyama, Masanori; Ehata, Shigeru; Ogusu, Chihaya; and Isozaki, Yukinao, 4,467,243, Cl. 313-448.000.
Futamoto, Masaaki; Yuito, Isamu; and Kawabe, Ushio, 4,467,240, Cl. 313-336.000.
Hata, Seiji; Terabayashi, Takao; Arakawa, Noriyoshi; and Watanabe, Makoto, 4,467,170, Cl. 219-121.0EH.
Hoshino, Takashi; and Tanaka, Hiromichi, 4,467,370, Cl. 360-13.000.
Inui, Taiji; and Sasaki, Makoto, 4,466,241, Cl. 60-39.182.
Ito, Tosikazu; and Chonan, Kenichi, 4,466,480, Cl. 165-12.000.
Matsushita, Yasuo; Nakamura, Kousuke; and Ura, Mitsuru, 4,467,309, Cl. 338-22.00R.
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.
Tahara, Kazuo; Matsui, Takayuki; Sasamoto, Hisaya; Koharagi, Haruo; Takahashi, Noriyoshi; and Takemura, Akira, 4,467,234, Cl. 310-195.000.
Wakai, Katsuro, 4,467,419, Cl. 364-200.000.
Hitachi Maxell, Ltd.: *See*—
Maehara, Yoshimi, 4,466,585, Cl. 242-199.000.
Hitachi Metals International Ltd.: *See*—
Thoe, James H., 4,467,388, Cl. 361-145.000.
Hjorth, Richard N.; Moore, Bobby O.; and Grant, Norman H., to American Home Products Corporation. Vaccine adjuvants. 4,466,957, Cl. 424-89.000.
Ho, Nelson; Thompson, Bryan; and Kratochvil, Jiri, to Critikon, Inc. Polarographic oxygen sensor. 4,466,879, Cl. 204-415.000.
Hock, Karl-Ludwig: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.
Hoeber, W. Gerhard: *See*—
Husges, Gerd; Hofer, Horst; and Hoeber, W. Gerhard, 4,466,575, Cl. 242-18.0PW.
Hoechst Aktiengesellschaft: *See*—
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,466,948, Cl. 423-321.00R.
Hoechst Aktiengesellschaft: *See*—
Koch, Manfred; and Stahler, Gerhard, 4,467,098, Cl. 548-263.000.
Millauer, Hans, 4,466,926, Cl. 260-458.00F.
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Adam, Wilhelm, 4,467,056, Cl. 523-208.000.
Voelskow, Hartmut; and Sukatsch, Dieter, 4,467,034, Cl. 435-139.000.
Hoefer, Wayne A.; and Busboom, Garry W., to Allis-Chalmers Corporation. Tailings return to threshing section or to cleaning section. 4,466,447, Cl. 130-27.00F.
Hofer, Horst: *See*—
Husges, Gerd; Hofer, Horst; and Hoeber, W. Gerhard, 4,466,575, Cl. 242-18.0PW.
Hoff, Morgan P., to Atari, Inc. Slave processor with clock controlled by internal ROM & master processor. 4,467,412, Cl. 364-200.000.
Hoffman, Brent K., to Linear Pneumatics Inc. Method of removing stuck gaskets and pneumatic impact tool. 4,466,167, Cl. 29-275.000.
Hoffman, Brent K., to Linear Pneumatics Inc. Method and apparatus for scraping adherent material from a smooth work surface. 4,466,851, Cl. 156-344.000.
Hoffman, David, to Rowe International, Inc. Apparatus for preventing circuit burn-out in multi-price merchandisers. 4,466,528, Cl. 194-1.00N.
Hoffmann-La Roche Inc.: *See*—
Gallati, Harald; and Brodbeck, Hans, 4,467,031, Cl. 435-7.000.
Hoffmann, Rolf-Ruediger: *See*—
Hilmann, Juergen; Hoffmann, Rolf-Ruediger; Muetzel, Wolfgang; and Zimmermann, Ingfried, 4,466,442, Cl. 128-653.000.
Hogarth, Harold W. Grip mounting assembly. 4,466,166, Cl. 29-235.000.
Hollman, Kenneth F.: *See*—
Hancock, Robert D.; and Hollman, Kenneth F., 4,466,746, Cl. 374-5.000.
Holtrop, John W., to United States of America, Navy. Hydraulic aircraft/stores cartridge. 4,466,334, Cl. 91-45.000.
Holtschmidt, Walter: *See*—
Dathe, Joachim; and Holtschmidt, Walter, 4,466,839, Cl. 148-1.500.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asaka, Urataro; Nakano, Teruyuki; Miyazawa, Shinkichi; and Masuda, Shoji, 4,466,409, Cl. 123-433.000.
Hasegawa, Shumpei; and Nakajima, Toyohei, 4,466,411, Cl. 123-480.000.
Irimajiri, Shoichiro; and Honda, Shoichi, 4,466,400, Cl. 123-193.00P.
Honda, Shoichi: *See*—
Irimajiri, Shoichiro; and Honda, Shoichi, 4,466,400, Cl. 123-193.00P.
Honeywell Inc.: *See*—
Carney, James K., 4,466,696, Cl. 350-96.200.
Droessler, Justin G.; and Jain, Anil K., 4,466,699, Cl. 350-166.000.
Foreman, Donald S., 4,467,194, Cl. 250-216.000.
Strobush, Victor H., 4,466,351, Cl. 102-275.000.
Van Sloun, Peter H., 4,466,332, Cl. 89-1.50R.
Wentworth, Milo R., 4,466,756, Cl. 403-311.000.
Honeywell Information Systems Inc.: *See*—
Cushing, David E.; Lemay, Richard A.; Stanley, Philip E.; and Woods, William E., 4,467,416, Cl. 364-200.000.
Woods, William E.; Cushing, David E.; Lemay, Richard A.; and Stanley, Philip E., 4,467,417, Cl. 364-200.000.
Hood, Charles B., to CVI Incorporated. Cryopump. 4,466,252, Cl. 62-55.500.
Hoogeveen, Frank: *See*—
Loscher, Lothar W.; Hoogeveen, Frank; and Hanselmann, Gerd, 4,466,429, Cl. 128-92.00E.
Hope, Thomas: *See*—
Dobson, John C.; and Hope, Thomas, 4,466,574, Cl. 239-455.000.
Hoppert, Hans: *See*—
Leupold, Gerhard; and Hoppert, Hans, 4,467,396, Cl. 361-321.000.
Hori, Kohei: *See*—
Ueno, Makoto; and Hori, Kohei, 4,466,404, Cl. 123-198.00F.
Horinouchi, Atsushi: *See*—
Nakata, Takeshi; Takase, Hitoshi; and Horinouchi, Atsushi, 4,467,164, Cl. 219-10.55M.

Horlacher, Paul; and Pfenninger, Heinz, to Ciba-Geigy Corporation. Process for the preparation of fluorescent brightener formulations which are stable on storage. 4,466,900, Cl. 252-301.230.
Horley, Albert L.: *See*—
Janky, James M.; and Horley, Albert L., 4,467,294, Cl. 333-126.000.
Horn, Dieter: *See*—
Ditter, Walter; Etzbach, Karl-Heinz; Horn, Dieter; Patsch, Manfred; and Eilingsfeld, Heinz, 4,466,899, Cl. 252-299.100.
Hornbaker, Edwin D.; and Jones, Jesse D., to Ethyl Corporation. Flame retarded polyethylene terephthalate blends. 4,467,062, Cl. 524-89.000.
Horstmann, Winfried, to Robert Bosch GmbH. Method and means for recording and playback of color television signals. 4,467,368, Cl. 358-310.000.
Horton, Robert: *See*—
Brouwer, Charles W.; Cowan, Larry C.; Horton, Robert; and Wueger, Karl W., 4,466,468, Cl. 139-435.000.
Horwath, Robert O.; and Colonna, William J., to Nabisco Brands, Inc. Process for oxidizing L-sorbitol to L-fructose. 4,467,033, Cl. 435-105.000.
Hoshino, Takashi; and Tanaka, Hiromichi, to Hitachi, Ltd. PCM Recorder with pause controlled signal rearranging. 4,467,370, Cl. 360-13.000.
Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Horizontal synchronizing circuit. 4,467,359, Cl. 358-159.000.
House, David W.; and Swedo, Raymond J., to UOP Inc. Electrically conducting polymers. 4,466,910, Cl. 252-500.000.
House, David W., to UOP Inc. Electrically conducting polymers. 4,466,911, Cl. 252-500.000.
Houser, John M., to Singer Company, The. Switch connection adapter. 4,466,686, Cl. 339-196.00M.
Houston, Theodore W.: *See*—
Darley, Henry M.; and Houston, Theodore W., 4,466,174, Cl. 29-571.000.
Hovind, John K., to National Gypsum Company. Stud extenders. 4,466,225, Cl. 52-730.000.
Howard, James T., to New York City Transit Authority. Multi-segment electrically insulated rail joint. 4,466,570, Cl. 238-153.000.
Howard, John A., to Stauffer Chemical Company. Method for propagating plants from tissue cultures. 4,466,216, Cl. 47-58.000.
Howlett, James J.; and Zagranski, Raymond D., to Chandler Evans Inc. Helicopter engine control with rotor speed decay anticipator. 4,466,526, Cl. 192-0.096.
Hsu, Chin C.; and Goscewski, Stanley R., to B. F. Goodrich Company, The. Preparation of film of web-reinforced photopolymerized hydrophilic interpolymer. 4,466,993, Cl. 427-44.000.
Huang, Cheng-Chung; and Chang, Tao, to Lockheed Missiles & Space Co. Vibration sensor. 4,466,738, Cl. 356-4.500.
Huang, Jen-chi; and Shelnut, James, to Polychrome Corporation. Acid interlayered planographic printing plate. 4,467,028, Cl. 430-302.000.
Hubbard, Karl E.; and Ventre, Augustus, to Dennison Manufacturing Company. Heat transferable labels. 4,466,994, Cl. 427-56.100.
Hubschen, Gerhard: *See*—
Repplinger, Wilhelm; Hubschen, Gerhard; and Salzburger, Hans-Jurgen J., 4,466,287, Cl. 73-643.000.
Hucker, David J.; and Schmitz, Norbert L., to Sundstrand Corporation. Alternator excitation system. 4,467,267, Cl. 322-61.000.
Huddle, Francis G., to William R. Selwood Limited. Diaphragm assembly. 4,466,339, Cl. 92-100.000.
Huddleston, Bruce C.: *See*—
Weber, Roy; and Huddleston, Bruce C., 4,466,359, Cl. 110-213.000.
Huggard, Mark T., to Mobil Oil Corporation. Heat-resistant foamed plastic materials. 4,466,933, Cl. 264-54.000.
Hughes Aircraft Company: *See*—
Ajioka, James S.; and Tang, Raymond, 4,467,292, Cl. 333-24.100.
Lewyn, Lanny L.; and Lucas, Charles H., 4,467,227, Cl. 307-577.000.
Moyer, Norman E., 4,467,451, Cl. 365-156.000.
Wiener-Avnear, Eliezer; and Grinberg, Jan, 4,466,702, Cl. 350-347.00R.
Hughes, Larry M., to RCA Corporation. Video disk player having door lock mechanism. 4,467,466, Cl. 369-77.200.
Hughes Tool Company: *See*—
Leuthen, John M., 4,467,258, Cl. 318-800.000.
Montgomery, James W., 4,466,617, Cl. 277-4.000.
Huhtala, Teuvo T., to Oy Safematic Ltd. Volume flow meter for a flowing medium. 4,466,293, Cl. 73-861.540.
Huisman, Hendrikus F., to U.S. Philips Corporation. Magnetic recording and playback device having means for reducing head corrosion. 4,467,382, Cl. 360-125.000.
Hultman, Bengt G.; and Nilsson, Rolf C., to Mo och Domsjo Aktiebolag. Process for the inhibition of the formation of deposits in cellulose pulping and cellulose pulp treating processes. 4,466,861, Cl. 162-38.000.
Human Oltoanyagtermeloo es Kutato Intezet: *See*—
Szijjarto nee Auber, Emilia; and Raskai, Magda, 4,466,961, Cl. 424-180.000.
Hunt, David J., to International Computers Limited. Array processor. 4,467,422, Cl. 364-200.000.
Hunt, Mack W.; and West, Charles T., to Standard Oil Company (Indiana). Molybdenum-containing friction modifying additive for lubricating oils. 4,466,901, Cl. 252-32.70E.
Hurley, James R.; and Gilker, Clyde, to McGraw-Edison Co. Solid state watt-hour meter. 4,467,434, Cl. 364-483.000.
Husges, Gerd; Hofer, Horst; and Hoeber, W. Gerhard, to Schubert & Salzer. Device for forming a reserve winding on a bobbin tube. 4,466,575, Cl. 242-18.0PW.
Husky Oil Operations Ltd.: *See*—
Ronden, Clifford P., 4,466,885, Cl. 208-188.000.
Huson, Gale W., to Signode Corporation. Slip seal joint for strap. 4,466,535, Cl. 206-83.500.
Huszczo, Walter. Tobacco curing barn. 4,466,450, Cl. 131-300.000.
Hutter, Charles G., III, to Physical Systems, Inc. Apparatus for separating and lifting units from a stack. 4,466,764, Cl. 414-121.000.
Hydromatik GmbH: *See*—
Stoelzer, Rainer, 4,466,338, Cl. 91-506.000.
Hydromer, Inc.: *See*—
Creasy, Walter S., 4,467,073, Cl. 525-127.000.
Hyodo, Motoi: *See*—
Oishi, Yaichi; Maruyama, Katsuaki; Takano, Kenji; Terada, Takami; and Hyodo, Motoi, 4,466,663, Cl. 297-410.000.
Ichikawa, Hiromichi; Saso, Kazuo; and Suganuma, Nobuo, to Lion Corporation. Oral composition. 4,466,954, Cl. 424-50.000.
ICI Americas Inc.: *See*—
Lee, John T. M., 4,466,489, Cl. 169-26.000.
Thomas, Royston, 4,467,119, Cl. 568-724.000.
Igel, Richard, to Webasto-Werk W. Baier GmbH & Co. Liftable roof panel assembly. 4,466,656, Cl. 296-216.000.
Iino, Masaru: *See*—
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, 4,467,361, Cl. 358-213.000.
Ikari, Hideo; and Hirohata, Michio, to Canon Kabushiki Kaisha. Electromagnetic drive device. 4,466,723, Cl. 354-400.000.
Ikeda, Nobuyuki, to Amada Company Limited. Method and apparatus for safety for presses. 4,466,317, Cl. 83-55.000.
Ikemori, Keiji; and Tanaka, Kazuo, to Canon Kabushiki Kaisha. Variable magnification lens system. 4,466,707, Cl. 350-422.000.
Iketani, Tomofumi: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Doi, Keiichiro; and Tanaka, Seiji, 4,467,162, Cl. 219-10.49R.
Imai, Ichiya: *See*—
Yokoyama, Takeo; Imai, Ichiya; and Asaoka, Hideaki, 4,467,295, Cl. 333-141.000.
Imai, Satoru: *See*—
Sakai, Hirohumi; Sukeda, Toshiaki; Yodoshi, Hiroyuki; and Imai, Satoru, 4,466,680, Cl. 339-45.00M.
Imai, Satoshi: *See*—
Tsuruoka, Takashi; Imai, Satoshi; Satoh, Atsuyuki; Watanabe, Tetsuro; Watanabe, Koji; Inouye, Shigeharu; and Niida, Taro, 4,466,913, Cl. 260-112.50R.
Imansri, Makoto; Oshida, Bunzi; Arima, Yusaku; Tanaka, Hirokazu; Todo, Yoshinori; Kobayashi, Norihisa; and Sera, Toshikuni, to Mitsubishi Petrochemical Co. Ltd.; Catalysts & Chemicals Ind. Co. Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Denitration catalyst and denitrating method. 4,466,947, Cl. 423-239.000.
Imazeki, Ryoji; and Yamazaki, Etsuo, to Fujitsu Fanuc Limited. Tracer control system. 4,467,432, Cl. 364-474.000.
Inaba, Hajimu; Nakajima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, to Fujitsu Fanuc Limited. Industrial robot. 4,466,769, Cl. 414-744.00R.
Inaba, Norihiko: *See*—
Asami, Shinichi; Sakamoto, Hiroshi; and Inaba, Norihiko, 4,467,339, Cl. 346-214.000.
Inagaki, Shigemi: *See*—
Inaba, Hajimu; Nakajima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, 4,466,769, Cl. 414-744.00R.
Inanaga, Takugi: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,467,377, Cl. 360-96.100.
Indiana University Foundation: *See*—
Hadd, Harry E., 4,466,952, Cl. 424-1.100.
Ingersoll-Rand Company: *See*—
Biswas, Chandi P., 4,466,785, Cl. 418-152.000.
Buse, Frederick W., 4,466,508, Cl. 184-13.100.
Inoue, Takehisa: *See*—
Iwayama, Kazuyoshi; Ebitani, Atsushi; Inoue, Takehisa; and Kani, Atsuo, 4,467,129, Cl. 585-481.000.
Inoue, Tokuta: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; and Inoue, Tokuta, 4,466,398, Cl. 123-188.00M.
Inouye, Shigeharu: *See*—
Tsuruoka, Takashi; Imai, Satoshi; Satoh, Atsuyuki; Watanabe, Tetsuro; Watanabe, Koji; Inouye, Shigeharu; and Niida, Taro, 4,466,913, Cl. 260-112.50R.
Inowa, Shigeru: *See*—
Seimiya, Ryubun; Inowa, Shigeru; Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,467,333, Cl. 346-154.000.
Institut Neftekhimicheskogo Sinteza Imeni A.V. Toncheva Akademii Nauk SSSR: *See*—
Zhuk, David S.; Keppen, Vera A.; Sivov, Nikolai A.; Tereschenko, Gennady F.; Golubkov, Igor M.; and Timofeev, Valery E., 4,467,115, Cl. 564-512.000.
Instrumentation Laboratory Inc.: *See*—
DiNitto, Robert G.; Harris, John C.; and Maciel, Robert F., 4,466,878, Cl. 204-415.000.
Interlab, Inc.: *See*—
Layton, Howard M., 4,466,454, Cl. 134-76.000.

International Business Machines Corporation: *See*—
Avritt, Michael D.; and Farrow, Michael M., 4,466,813, Cl. 55-74.000.
Balliet, Layton; Coffman, Donald H.; and Gomez, Carlos, 4,467,196, Cl. 250-227.000.
Champion, James R.; and Pries, Robert W., 4,466,731, Cl. 355-14.00D.
Chao, Hu H., 4,466,177, Cl. 29-571.000.
Economy, James; Volksen, Willi; and Yoon, Do Y., 4,467,000, Cl. 427-385.500.
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,467,411, Cl. 364-200.000.
Harris, Richard H., 4,466,302, Cl. 74-100.00R.
Herman, Richard L., 4,466,520, Cl. 192-28.000.
Langdon, Glen G., Jr.; and Rissanen, Jorma J., 4,467,317, Cl. 340-347.0DD.
Mueller, Mark W.; Parker, Thomas S.; Benignus, Douglas M.; and Frye, James L., 4,467,445, Cl. 364-900.000.
Ottman, John C.; and Shen, John C. S., 4,466,218, Cl. 51-395.000.
Regehr, John L.; and Sendelbach, Lee A., 4,467,448, Cl. 364-900.000.
Rhodes, Kenneth E., 4,467,439, Cl. 364-716.000.
Tench, James G., Jr., 4,467,363, Cl. 358-261.000.
International Chemical Engineering Establishment: *See*—
Bos, Arnoldus J. B. M., 4,466,157, Cl. 17-49.000.
International Computers Limited: *See*—
Hunt, David J., 4,467,422, Cl. 364-200.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Belko, Robert P.; and Greene, Roger E., 4,466,908, Cl. 252-522.00R.
Yoshida, Takao, 4,466,898, Cl. 252-174.110.
International Harvester Co.: *See*—
Romer, Friedrich W., 4,466,519, Cl. 192-13.00R.
International Minerals & Chemical Corp.: *See*—
Dennis, Richard S., 4,466,944, Cl. 423-6.000.
International Paper Company: *See*—
Ring, Michael; and Angelini, Peter, 4,466,862, Cl. 162-55.000.
International Standard Electrik Corporation: *See*—
Eichhorn, Winfried; and Eclercy, Kurt, 4,467,232, Cl. 310-154.000.
International Telephone & Telegraph Corporation: *See*—
Kruger, Bradford E., 4,466,695, Cl. 350-96.200.
Intertherm Inc.: *See*—
Ali, Rafath; and Vaughn, Thomas D., 4,467,179, Cl. 219-368.000.
Inui, Taiji; and Sasaki, Makoto, to Hitachi, Ltd. Waste heat recovery boiler. 4,466,241, Cl. 60-39.182.
Iowa Precision Industries, Inc.: *See*—
Heilman, Robert R.; and McElroy, Howard J., 4,466,641, Cl. 285-406.000.
Ipposha Oil Industries, Co., Ltd.: *See*—
Kumagae, Shinichi; and Manabe, Tatsuo, 4,466,902, Cl. 252-391.000.
Irimajiri, Shoichiro; and Honda, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,466,400, Cl. 123-193.00P.
Irwin, George W.; and Mumford, Eustace H., to Owens-Illinois, Inc. Baffle moving and alignment means for the four gob glass forming machine. 4,466,821, Cl. 65-307.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,466,258, Cl. 68-5.00C.
Ishii, Isao: *See*—
Murakami, Yoshihiro; Takeuchi, Toyoshi; Ishii, Isao; Murakami, Tadaki; and Takayanagi, Hiroshi, 4,466,793, Cl. 432-253.000.
Ishikawa, Katsuji: *See*—
Hasegawa, Wataru; and Ishikawa, Katsuji, 4,467,362, Cl. 358-227.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Shibuya, Kiyoshi; Shimanaka, Hiroshi; and Tanaami, Yoshiaki, 4,466,578, Cl. 242-65.000.
Ishima, Kazumi, to Ricoh Company, Ltd. Liquid temperature control apparatus comprising initial temperature dependent high power heater drive. 4,467,183, Cl. 219-497.000.
Isogai, Kiyoshi: *See*—
Kato, Shinichi; Motosugi, Katsuhiko; Isogai, Kiyoshi; Koga, Ituo; and Takita, Naka, 4,466,397, Cl. 123-188.00M.
Isomura, Shigenori: *See*—
Sakakibara, Shuji; Kondo, Toshio; Kobayashi, Akio; and Isomura, Shigenori, 4,466,410, Cl. 123-440.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See*—
Szabolcs, Otto, 4,467,122, Cl. 568-727.000.
Isozaki, Yukinao: *See*—
Fukushima, Masakazu; Maruyama, Masanori; Ehata, Shigeru; Oguuu, Chihaya; and Isozaki, Yukinao, 4,467,243, Cl. 313-448.000.
Israel Aircraft Industries Ltd.: *See*—
Grynberg, Ami; Perlstein, Abraham; and Gliksman, Edward, 4,466,288, Cl. 73-654.000.
Israel, Terry P. Exercise club. 4,466,610, Cl. 272-93.000.
Itabashi, Keiji: *See*—
Takaishi, Tetsuo; Itabashi, Keiji; Morishita, Satoru; and Hatotani, Hisashi, 4,466,812, Cl. 55-68.000.
Italimpianti Societa Italiana Impianti P.A.: *See*—
Ballabene, Corrado; and Dotsch, Horst, 4,466,792, Cl. 432-122.000.
Itani, Takashi, to Canon Kabushiki Kaisha. Recording and/or reproducing device making use of a cassette. 4,467,379, Cl. 360-96.500.
Itano, Frank. Emergency escape apparatus. 4,466,507, Cl. 182-3.000.
Itek Corporation: *See*—
Ager, Verkuilen B., 4,466,192, Cl. 33-1.00B.
Nelson, Erik K., 4,466,735, Cl. 355-71.000.
Ito, Hajime: *See*—
Yoshino, Yasuhisa; Kodera, Masao; Ito, Hajime; and Ohta, Hisatoshi, 4,467,313, Cl. 340-904.000.
Ito, Haruo: *See*—
Maeda, Koichi; and Ito, Haruo, 4,467,275, Cl. 324-73.0AT.
Ito, Hiroshi; Kuno, Hiroshi; and Kai, Tooru, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyoda Gosei Co., Ltd. Method of and apparatus for detecting external defects of a circular sealing member. 4,467,214, Cl. 250-563.000.
Ito, Susumu: *See*—
Inaba, Hajimu; Nakajima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, 4,466,769, Cl. 414-744.00R.
Ito, Tetsuro: *See*—
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, 4,467,167, Cl. 219-69.00C.
Ito, Tosikazu; and Chonan, Kenichi, to Hitachi, Ltd. Temperature control apparatus for a motor vehicle air conditioner. 4,466,480, Cl. 165-12.000.
Ivasyuk, Boris N.: *See*—
Joffe, Boris B.; Spongr, Jerry J.; and Ivasyuk, Boris N., 4,467,198, Cl. 250-308.000.
Iwahashi, Hiroshi; and Asano, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Nonvolatile semiconductor memory device. 4,467,457, Cl. 365-228.000.
Iwama, Norio: *See*—
Asano, Katsuhiro; and Iwama, Norio, 4,467,407, Cl. 363-43.000.
Iwasaki, Dean H.: *See*—
Baidwan, Balinderjeet S.; and Iwasaki, Dean H., 4,466,446, Cl. 128-765.000.
Iwata, Yasuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,466,729, Cl. 355-3.0CH.
Iwayama, Kazuyoshi; Ebitani, Atsushi; Inoue, Takehisa; and Kani, Atsuo, to Toray Industries, Inc. Conversion of xylenes containing ethylbenzene. 4,467,129, Cl. 585-481.000.
Izumita, Morishi: *See*—
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.
J. I. Case Company: *See*—
Hanson, Charles B., 4,466,494, Cl. 173-46.000.
J-U-B Engineers, Inc.: *See*—
Murphy, Robert E., 4,467,216, Cl. 290-43.000.
Jaccard, Pierre: *See*—
Bonnet, Jacques; Jaccard, Pierre; and Veluz, Serge, 4,466,451, Cl. 131-335.000.
Jackson, Hiram S., to S&C Electric Company. Pressure-operated switch for a high-voltage interrupting module. 4,467,307, Cl. 337-30.000.
Jackson, Terry R. Measurement device for indicating the state-of-charge of electrolytic storage type cells. 4,467,017, Cl. 429-9.000.
Jacobs, Brian E.; and March, Edward J., to AT&T Technologies, Inc. Single vapor condensation soldering facility. 4,466,791, Cl. 432-23.000.
Jacques, Jean: *See*—
Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , 4,466,971, Cl. 424-266.000.
Jaeger, Walter, to GX-Holding AG. Process for the recording on, and reading of, store tapes. 4,467,376, Cl. 360-84.000.
Jageler, Alfred H., to Standard Oil Company, The. Pressure core barrel for the sidewall coring tool. 4,466,495, Cl. 175-59.000.
Jain, Anil K.: *See*—
Droessler, Justin G.; and Jain, Anil K., 4,466,699, Cl. 350-166.000.
Jakab, Gyula, to Northern Telecom Limited. Telephone subscriber line battery feed resistor arrangements. 4,467,310, Cl. 338-22.00R.
James, David E.: *See*—
Puskas, Imre; and James, David E., 4,467,110, Cl. 562-487.000.
Puskas, Imre; and James, David E., 4,467,111, Cl. 562-487.000.
Janky, James M.; and Horley, Albert L., to Vitalink Communications Corporation. Waveguide apparatus and method for dual polarized and dual frequency signals. 4,467,294, Cl. 333-126.000.
Janney, Charles E.: *See*—
McElroy, John M.; and Janney, Charles E., 4,467,270, Cl. 324-51.000.
Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata; and Hanyu, Susumu, 4,466,370, Cl. 112-269.100.
Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,466,368, Cl. 112-191.000.
Jansen, Frank; and Mort, Joseph, to Xerox Corporation. Plasma deposition apparatus for photoconductive drums. 4,466,380, Cl. 118-712.000.
Janson, Kenneth D. Sign holder. 4,466,592, Cl. 248-225.100.
Japan Atomic Energy Research Institute: *See*—
Sakurada, Ichiro; Kaji, Kanako; and Okada, Toshio, 4,466,990, Cl. 427-35.000.
Jaster, Heinz, to General Electric Company. Flow control at flash tank of open cycle vapor compression heat pumps. 4,466,253, Cl. 62-188.000.
Jelberyd, Leif; and Egerstrom, Gunnar, to Nitro Nobel AB. Apparatus for charging rising drillholes. 4,466,354, Cl. 102-313.000.
Jencks, Charles L.: *See*—
Collin, Edwin J.; and Jencks, Charles L., 4,467,299, Cl. 335-20.000.
Jenkins, George M., to Northern Telecom Limited. Coating of semiconductor wafers and apparatus therefor. 4,466,381, Cl. 118-728.000.

Jenko, Branko; and Langof, Igor, to LEK, Tovarna Farmacevtskih in Kemicnih Izdelkov, N.Sol.O. Process for preparing a 1,4-dihydropyridine derivative. 4,467,093, Cl. 546-321.000.

Jenoptik Jena GmbH: *See*—
Meier, Ludwig; Kuhn, Gebhard; and Scharf, Klaus-Dieter, 4,466,717, Cl. 353-122.000.

Jet Spray Corp.: *See*—
Gross, Thomas A. O.; Lalumiere, Edward; and Arzberger, William A., 4,467,222, Cl. 307-115.000.

Jeumont-Schneider: *See*—
Falbierski, Jean-Jacuqes, 4,466,752, Cl. 384-192.000.

Jochems, Pieter J. W., to U.S. Philips Corporation. Method of manufacturing a semiconductor device utilizing outdiffusion to convert an epitaxial layer. 4,466,171, Cl. 29-571.000.

Joffe, Boris B.; Spongr, Jerry J.; and Ivasyuk, Boris N., to Twin City International Inc. Radiation shielding arrangement for coating thickness measurement device. 4,467,198, Cl. 250-308.000.

Johansson, Borje: *See*—
Santen, Sven; and Johansson, Borje, 4,466,807, Cl. 48-197.00R.

John Wyeth & Brother Limited: *See*—
Cavalla, John F.; and Stephens, Roger J., 4,466,963, Cl. 424-244.000.
Edington, Edwin T.; and White, Alan C., 4,467,091, Cl. 546-285.000.

Johnson, Douglas E.: *See*—
Person, Herman R.; and Johnson, Douglas E., 4,467,311, Cl. 338-293.000.

Johnson, Herbert E., III. Molecular velocity vector biasing method and apparatus for gases. 4,466,811, Cl. 55-17.000.

Johnson, Philip W., to Standard Oil Company, The. Seismic data acquisition method. 4,467,460, Cl. 367-56.000.

Johnson, Robert J.; Miller, Charles N.; and Bonnie, G. Patrick, to Control Data Corporation. Planar touch panel. 4,467,151, Cl. 200-5.00A.

Johnson, Thomas H., to Shell Oil Company. Metal oxide-tantalum (V) hydride/oxide compositions and process for preparing them. 4,467,047, Cl. 502-246.000.

Johnson, Thomas H., to Shell Oil Company. Metal oxide-niobium (V) hydride/oxide compositions and process for preparing them. 4,467,048, Cl. 502-246.000.

Johnston, Roy G. S.; and Pavelin, Dennis F., to Wessex Mosaic Studies Ltd. Production of Venetian mosaic surfaces. 4,466,937, Cl. 264-256.000.

Jonathan, Paget; and Thomas, David H., to Raychem Limited. Cable breakout article. 4,467,137, Cl. 174-87.000.

Jones, Arnold H.; and Grissom, Donald L., to Litton Systems, Inc. Shock and vibration sensitive switch. 4,467,153, Cl. 200-61.45R.

Jones, Bobby L. Bowstring trigger release mechanism. 4,466,418, Cl. 124-35.00A.

Jones, David B.; and Powell, Brian D., to MFC Survival Limited. Stretcher. 4,466,145, Cl. 5-82.00R.

Jones, Donald G. Handgun holster mounting device. 4,466,148, Cl. 5-503.000.

Jones, Gary P.; and Larson, Myles A., to E-Systems, Inc. Programmable detector for tone signals. 4,467,277, Cl. 324-78.00R.

Jones, Gordon H.; Venuti, Michael C.; and Young, John M., to Syntex (U.S.A.) Inc. Naphthalene anti-psoriatic agents. 4,466,981, Cl. 424-311.000.

Jones, Jesse D.: *See*—
Hornbaker, Edwin D.; and Jones, Jesse D., 4,467,062, Cl. 524-89.000.

Jones, Kenneth R., to Mustang Trip saver, Inc. Technique for damping oscillations in a drill string. 4,466,496, Cl. 175-67.000.

Jonsson, Bert O., to Besam AB. Object sensing apparatus. 4,467,251, Cl. 318-480.000.

Joseph Kieninger GmbH & Co. KG: *See*—
Hepfer, Rolf; and Runzler, Jurgen, 4,466,744, Cl. 368-262.000.

Jugle, Don B., to Xerox Corporation. Development apparatus. 4,466,730, Cl. 355-3.0DD.

Juodenas, George G. Signal monitoring instrument. 4,467,372, Cl. 360-31.000.

Juretzek, Heinz; Kriesten, Wolfgang; and Sindermann, Paul, to Chemische Werke Huls AG. Disintegrating, densely filled polyamide molding composition. 4,466,330, Cl. 86-20.00R.

Jurt, Alfred, to Trisa Burstenfabrik AG. Toothbrush. 4,466,150, Cl. 15-143.00R.

Jusseau, Marcel; Borne, Andre ; Fermond, Gilbert; and Heng, Jean P., to CGEE Alsthom. Terminal block for electric connection without stripping. 4,466,682, Cl. 339-97.00R.

Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, to Bayer Aktiengesellschaft. Lipid absorption-inhibiting 1,4-benzothiazines. 4,466,964, Cl. 424-246.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Minamida, Kazukiyo; and Ohta, Kouichi, 4,466,499, Cl. 177-1.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Takauji, Kiyomi, 4,466,325, Cl. 84-1.220.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, 4,467,185, Cl. 219-539.000.

Kabushiki Kaisha Nichibei: *See*—
Saito, Yasuji; and Yamanaka, Hiroomi, 4,466,475, Cl. 160-297.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Kitamura, Yoshio, 4,466,328, Cl. 84-98.000.

Kabushiki Kaisha Sato: *See*—
Kashiwaba, Tadao, 4,466,855, Cl. 156-541.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Tanaka, Susumu, 4,466,713, Cl. 351-106.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ota, Yoshihiro; and Kobayashi, Mitsuo, 4,467,159, Cl. 200-153.00J.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Asano, Katsuhiro; and Iwama, Norio, 4,467,407, Cl. 363-43.000.
Ito, Hiroshi; Kuno, Hiroshi; and Kai, Tooru, 4,467,214, Cl. 250-563.000.

Kai, Tooru: *See*—
Ito, Hiroshi; Kuno, Hiroshi; and Kai, Tooru, 4,467,214, Cl. 250-563.000.

Kaim, John W.: *See*—
Altherr, Russell G.; and Kaim, John W., 4,466,546, Cl. 213-148.000.

Kaji, Kanako: *See*—
Sakurada, Ichiro; Kaji, Kanako; and Okada, Toshio, 4,466,990, Cl. 427-35.000.

Kaji, Yasutaka. Three piece wheel for vehicle tires. 4,466,670, Cl. 301-11.0CD.

Kaldenbach, Erwin, to Lindeman Maschinenfabrik GmbH. Apparatus for pressing and binding bales of refuses. 4,466,345, Cl. 100-19.00R.

Kaltz, Milton C.; and Trotter, Richard H., to American Sunroof Corporation. Lifter apparatus for pivotal-sliding roof panel assembly. 4,466,657, Cl. 296-221.000.

Kalwar, Klaus; Freytag, Egon; Hirschinger, Lothar; and Ebner, Klaus, to Kalwar, Klaus; and Carl Freudenberg, Firma. Device for the surface treatment of thermoplastic moldings by corona discharge. 4,467,200, Cl. 250-324.000.

Kamei, Takao: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,466,199, Cl. 34-9.000.

Kamijo, Ken: *See*—
Takeda, Hitoshi; Suzuki, Hidetaka; Kamijo, Ken; and Nagashima, Hideyuki, 4,467,252, Cl. 318-603.000.

Kamimoto, Fukuyoshi: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.

Kamimura, Tetsuro: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,467,377, Cl. 360-96.100.

Kanai, Tsuyoshi: *See*—
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, 4,467,061, Cl. 524-87.000.

Kandler, Joachim: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Adam, Wilhelm, 4,467,056, Cl. 523-208.000.

Kane, Paul H.: *See*—
Hedges, Richard A.; Shockley, David L.; Fralick, Stanley C.; and Kane, Paul H., 4,467,424, Cl. 364-412.000.

Kanebo Ltd.: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,466,932, Cl. 264-29.300.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Miyashita, Shunitsu; and Somemiya, Akiyoshi, 4,467,076, Cl. 525-391.000.

Kani, Atsuo: *See*—
Iwayama, Kazuyoshi; Ebitani, Atsushi; Inoue, Takehisa; and Kani, Atsuo, 4,467,129, Cl. 585-481.000.

Kano, Hideo: *See*—
Oka, Masahiko; Kano, Hideo; and Ueta, Yutaka, 4,467,074, Cl. 525-356.000.

Kano, Tokio; and Tamagawa, Akira, to Olympus Optical Co., Ltd. Particle agglutination analyzing plate. 4,466,740, Cl. 356-246.000.

Kansas State University Research Foundation: *See*—
Tsen, Cho C.; and Adams, Karl B., 4,466,985, Cl. 426-131.000.

Karashima, Masashi. Refrigerated showcase. 4,466,254, Cl. 62-256.000.

Karl Lumberg GmbH & Co.: *See*—
Fuchs, Helmut, 4,466,678, Cl. 339-17.0CF.

Karpa, Michael J. Vehicle weighing device. 4,466,501, Cl. 177-134.000.

Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Label delaminating and applying device. 4,466,855, Cl. 156-541.000.

Kaski, Erkki: *See*—
Tervamaki, Jukka; Kaski, Erkki; Fagerstedt, Mikael; and Kukka, Aarre, 4,466,298, Cl. 73-864.180.

Kasner, William H.; Racki, Daniel J.; and Swenson, Clark E. Laser beam alignment system. 4,466,739, Cl. 356-138.000.

Kasten, Alan J., to Harris Corporation. Method for providing polysilicon thin films of improved uniformity. 4,466,179, Cl. 29-576.00T.

Katayama Chemical Works Co., Ltd.: *See*—
Magami, Masato; Sato, Toshio; Katayama, Sakae; and Umekawa, Osamu, 4,466,975, Cl. 424-270.000.

Katayama, Sakae: *See*—
Magami, Masato; Sato, Toshio; Katayama, Sakae; and Umekawa, Osamu, 4,466,975, Cl. 424-270.000.

Katayma, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Mechanism for preventing misoperation in a manual transmission. 4,466,306, Cl. 74-477.000.

Kato, Masatake; and Hashimoto, Shigeru, to Canon Kabushiki Kaisha. Large relative aperture objective lens. 4,466,710, Cl. 350-464.000.

Kato, Shinichi; Dohi, Yoshihiko; Motosugi, Katsuhiko; and Koga, Ituo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control device of a helically-shaped intake port. 4,466,395, Cl. 123-188.00M.

Kato, Shinichi; Motosugi, Katsuhiko; Isogai, Kiyoshi; Koga, Ituo; and Takita, Naka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow

control device of a helically-shaped intake port. 4,466,397, Cl. 123-188.00M.

Kato, Toshihiro, to Fuji Photo Film Co., Ltd. Tape surface discriminating system. 4,467,215, Cl. 250-571.000.

Kato, Toshikazu, to Olympus Optical Co., Ltd. Cassette loading/unloading apparatus for cassette tape recorder. 4,467,380, Cl. 360-96.500.

Kato, Yoshiaki: *See*—
Mizuno, Takaji; Kato, Yoshiaki; and Shimizu, Takao, 4,467,176, Cl. 219-137.710.

Kato, Yoshitaka: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.

Katsura, Yuji: *See*—
Hatta, Tokuaki; Ueno, Haruyuki; Katsura, Yuji; Fukuda, Kazushige; Kubota, Hiroshi; and Hamamatu, Takashi, 4,467,042, Cl. 501-88.000.

Katz, Jay W. Method and means for treating symptoms of Meniere's disease or the like. 4,466,438, Cl. 128-400.000.

Katz, Sheldon. Fabric wind shield and storage device for boats. 4,466,374, Cl. 114-71.000.

Katzaneck, Bernard: *See*—
Aronowitz, Robert; and Katzaneck, Bernard, 4,466,665, Cl. 297-418.000.

Kaup, Friedel; and Warnke, Heinrich, to Miele & Cie. GmbH & Co. Method for electrophoretic enameling. 4,466,871, Cl. 204-181.00N.

Kaustrater, Gert, to Kuka Wehrtechnik GmbH. Armored vehicle. 4,466,333, Cl. 89-36.00H.

Kautt & Bux KG: *See*—
Weber, Edwin, 4,467,398, Cl. 361-331.000.

Kawabe, Ushio: *See*—
Futamoto, Masaaki; Yuito, Isamu; and Kawabe, Ushio, 4,467,240, Cl. 313-336.000.

Kawada, Hiroh: *See*—
Goto, Kiyoshi; Kawada, Hiroh; and Kita, Noriyasu, 4,467,025, Cl. 430-191.000.

Kawai, Toshikazu; and Negishi, Akira, to Central Glass Company Limited. Preparation of 1,1,1,3,3,3-hexafluoropropane-2-ol by vapor phase catalytic reaction of hexafluoroacetone hydrate with hydrogen. 4,467,124, Cl. 568-842.000.

Kawamura, Naoto; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Information detecting apparatus. 4,467,195, Cl. 250-216.000.

Kawamura, Takahide: *See*—
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,466,392, Cl. 123-179.00G.

Kawamura, Yoshihisa, to Nissan Motor Company, Limited. Exhaust gas recirculation control method and apparatus for a diesel engine. 4,466,416, Cl. 123-571.000.

Kawasaki Jukogyo Kobushiki Kaisha: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,466,199, Cl. 34-9.000.

Kawasaki Kasei Chemicals Ltd.: *See*—
Matsuura, Ryo; Nagaoka, Kazuya; Kusabe, Kouji; and Nakatani, Shuichi, 4,467,112, Cl. 562-493.000.

Kawasaki Seitetsu Kabushiki Kaisha: *See*—
Shibuya, Kiyoshi; Shimanaka, Hiroshi; and Tanaami, Yoshiaki, 4,466,578, Cl. 242-65.000.

Kawasaki Steel Corporation: *See*—
Kondo, Mikio; and Okabe, Kyoji, 4,466,825, Cl. 75-41.000.

Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix. 4,466,953, Cl. 424-28.000.

Kelland, David R.: *See*—
Maxwell, Emanuel; and Kelland, David R., 4,466,362, Cl. 110-347.000.

Kellar, Paul R. N.: *See*—
Taylor, Richard J.; and Kellar, Paul R. N., 4,467,373, Cl. 360-38.100.

Kemmner, Ulrich; and Ringwald, Peter, to Robert Bosch GmbH. Arrangement for feeding fuel, particularly from supply container to internal combustion engine of a power vehicle. 4,466,781, Cl. 417-366.000.

Kendall, Debra L.: *See*—
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., 4,466,905, Cl. 252-403.000.

Kendig, Warren C., to United States of America, Air Force. Aircraft thrust control scheme for terrain following system. 4,467,429, Cl. 364-433.000.

Kenfair Manufacturing Co.: *See*—
Fairbanks, Lyman N., 4,466,476, Cl. 160-330.000.

Keppen, Vera A.: *See*—
Zhuk, David S.; Keppen, Vera A.; Sivov, Nikolai A.; Tereschenko, Gennady F.; Golubkov, Igor M.; and Timofeev, Valery E., 4,467,115, Cl. 564-512.000.

Kermabon, Andre J., to Syminex (Societe Anonyme). Electrical device for promoting oil recovery. 4,466,484, Cl. 166-60.000.

Kerschbaumer, Klaus: *See*—
Resch, Heinz; Machl, Franz; Kerschbaumer, Klaus; and Ullrich, Helmut, 4,467,141, Cl. 179-2.0EA.

Kerwin, John M.: *See*—
Henery, Maurice D.; Kerwin, John M.; and Walker, Walter W., 4,466,361, Cl. 110-346.000.

Kester, Bruce J.; Urban, Arthur L.; and Kester, Dale C., to Conchemco, Incorporated. Control assembly for lawnmower having electrically started engine. 4,466,308, Cl. 74-483.00R.

Kester, Dale C.: *See*—
Kester, Bruce J.; Urban, Arthur L.; and Kester, Dale C., 4,466,308, Cl. 74-483.00R.

Ketharanathan, Vettivetpillai. Vascular prostheses. 4,466,139, Cl. 3-1.400.

Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,466,953, Cl. 424-28.000.

Keyes, Marion A., IV, to Babcock & Wilcox Company, The. Force transducer range adjuster. 4,466,296, Cl. 73-862.520.

Khoe, Giok-Khoen. Process and apparatus for drying a granular free flowing bulk material. 4,466,200, Cl. 34-10.000.

Kiemer, Ralph F.: *See*—
Baugher, Robert C.; Kiemer, Ralph F.; and Smith, Raymond R., Jr., 4,466,531, Cl. 198-486.000.

Kim, Dongsung R., to Burroughs Corporation. Multi-phase subroutine control circuitry. 4,467,410, Cl. 364-200.000.

Kim, Young G.; and Park, Dong K., to Poong San Metal Corporation. Process of producing copper-alloy and copper alloy plate used for making electrical or electronic parts. 4,466,939, Cl. 420-485.000.

Kimberlin, Denver K., to Engineering Enterprises, Inc. Pump control circuit. 4,466,777, Cl. 417-12.000.

Kimberly-Clark Corporation: *See*—
Shultz, Jay S., 4,466,430, Cl. 128-132.00D.

Kimura, Katsuyoshi; and Matsumoto, Shojiro, to National Research Institute for Metals. Reference block used in ultrasonic examination. 4,466,270, Cl. 73-1.00R.

King, Francis G.: *See*—
Gable, Stewart V.; Glover, Robert N.; King, Francis G.; and Meier, Raymond C., Jr., 4,466,279, Cl. 73-117.000.

King, Raymond W.: *See*—
Baier, Robert E.; King, Raymond W.; and Meyer, Anne E., 4,466,277, Cl. 73-61.200.

Kino Precision Industries, Ltd.: *See*—
Osawa, Masami, 4,466,709, Cl. 350-429.000.

Kinoshita, Mitsuo: *See*—
Gamo, Gotaro; and Kinoshita, Mitsuo, 4,467,166, Cl. 219-69.00W.

Kirkpatrick, Charles R.: *See*—
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,467,411, Cl. 364-200.000.

Kishi, Mitsuhiro. Elevating device. 4,466,509, Cl. 187-18.000.

Kishimoto, Keiichi: *See*—
Shirahata, Akihiko; and Kishimoto, Keiichi, 4,467,082, Cl. 528-43.000.

Kishimoto, Tadao; and Tsuda, Takao, to Konishiroku Photo Industry Co., Ltd. Elevator type paper feeding apparatus. 4,466,604, Cl. 271-111.000.

Kissel, Rolande; Berger, Pierre; and Chrysostome, Gerard, to Creusot-Loire. Fuel supply method for a gasification chamber. 4,466,809, Cl. 48-197.00R.

Kita, Noriyasu: *See*—
Goto, Kiyoshi; Kawada, Hiroh; and Kita, Noriyasu, 4,467,025, Cl. 430-191.000.
Yamamoto, Takeshi; Goto, Kiyoshi; Kurita, Yoshio; Kita, Noriyasu; and Kunieda, Naoshi, 4,467,027, Cl. 430-302.000.

Kitagawa, Kiyoshi; and Komatsuzaki, Atsushi, to Unitika Ltd. Shrinkable polyamide film and process for its production. 4,467,084, Cl. 528-324.000.

Kitagishi, Nozomu: *See*—
Suzuki, Takashi; Kitagishi, Nozomu; and Matsumura, Susumu, 4,467,188, Cl. 250-204.000.

Kitahata, Tamio: *See*—
Nishide, Toshikazu; Kobayashi, Akio; and Kitahata, Tamio, 4,467,029, Cl. 430-441.000.

Kitamura, Yoshio, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box for playing music with disk or card as medium. 4,466,328, Cl. 84-98.000.

Kito, Eiichi: *See*—
Kobayashi, Kazuhiko; Kito, Eiichi; Watase, Nobuo; and Uchiyama, Kaoru, 4,466,316, Cl. 83-13.000.

Kittinger, Bruce E.: *See*—
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,467,411, Cl. 364-200.000.

Kiuchi, Mitsuyuki; and Mizukawa, Takumi, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus. 4,467,165, Cl. 219-10.770.

Klatt, John H.; and Matsko, Theodore N., to Babcock & Wilcox Company, The. Boiler cleaning optimization with fouling rate identification. 4,466,383, Cl. 122-379.000.

Kleinhammer, Gerd; Deutsch, Gerlinde; Linke, Hans-Ralf; Stahler, Fritz; and Gruber, Wolfgang, to Boehringer Mannheim GmbH. Determination of the thyroxine-binding index in serum. 4,467,030, Cl. 435-7.000.

Klenk, Martin: *See*—
Hartung, Erwin; Klenk, Martin; and Moller, Heinz, 4,466,406, Cl. 123-425.000.

Kling, Michael J.; and Marino, Joseph A., to Bear Automotive Service Equipment Company. Engine analyzer with simulated analog meter display. 4,467,323, Cl. 340-721.000.

Klittich, Klaus. Disposable flexible containers for baby feeding bottles. 4,466,547, Cl. 215-11.00E.

Klose, Walter; and Boettcher, Irmgard, to Schering Aktiengesellschaft. Antiinflammatory and antiallergic imidazole derivatives. 4,466,976, Cl. 424-273.00R.

Knab, Rochus: *See*—
Aures, Reinhard; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,466,407, Cl. 123-425.000.

Knabel, Walter; and Wagner, Ludwig, to MARKER Patentverwertungsgesellschaft mbH. Heel holder for safety ski bindings. 4,466,634, Cl. 280-632.000.

Knecht Filterwerke GmbH: *See*—
Faas, Harald; Lenzen, Ditrich; Weik, Hans; Ostermann, Albrecht; and Reimann, Wolfgang, 4,466,817, Cl. 55-455.000.

Knipp, Roger W., to Christie Electric Corp. Magnetic tape degausser and method of erasing magnetic recording tape. 4,467,389, Cl. 361-151.000.

Knittel, Helmut: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.

Kobayashi, Akio; Ozaki, Yasuo; and Rikitake, Sunao, to Tokyo Shibaura Denki Kabushiki Kaisha. Puffer type gas circuit. 4,467,158, Cl. 200-148.00A.

Kobayashi, Akio: *See*—
Nishide, Toshikazu; Kobayashi, Akio; and Kitahata, Tamio, 4,467,029, Cl. 430-441.000.
Sakakibara, Shuji; Kondo, Toshio; Kobayashi, Akio; and Isomura, Shigenori, 4,466,410, Cl. 123-440.000.

Kobayashi, Fumio, to Ohi Seisakusho Co., Ltd. Automobile door latch striker. 4,466,645, Cl. 292-341.120.

Kobayashi, Kazuhiko; Kito, Eiichi; Watase, Nobuo; and Uchiyama, Kaoru, to Fuji Photo Film Co., Ltd. Photographic film trailing end cutting method and apparatus. 4,466,316, Cl. 83-13.000.

Kobayashi, Mitsuo: *See*—
Ota, Yoshihiro; and Kobayashi, Mitsuo, 4,467,159, Cl. 200-153.00J.

Kobayashi, Norihisa: *See*—
Imanari, Makoto; Oshida, Bunzi; Arima, Yusaku; Tanaka, Hirokazu; Todo, Yoshinori; Kobayashi, Norihisa; and Sera, Toshikuni, 4,466,947, Cl. 423-239.000.

Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, to Nippon Television Network Corp.; and Nippon Electric Co., Ltd. Method of pre-editing an original video tape in combination of scene numbers with a card and systems for carrying out the method. 4,467,371, Cl. 360-14.300.

Koch, Ferdinand: *See*—
Lauermann, Georg; Scholz, Siegfried; and Koch, Ferdinand, 4,466,959, Cl. 424-150.000.

Koch, Manfred; and Stahler, Gerhard, to Hoechst Aktiengesellschaft. Process for the manufacture of substituted 3-hydroxy-1,2,4-triazoles. 4,467,098, Cl. 548-263.000.

Koch, Robert E.: *See*—
Bergh, Daniel D.; Koch, Robert E.; and Timoshenko, John A., 4,467,387, Cl. 361-132.000.

Kochendorfer, Richard: *See*—
Hinz, Bernhard; and Kochendorfer, Richard, 4,466,399, Cl. 123-193.0CP.

Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, to Ciba-Geigy Corporation. Compounds with terminal aminocarboxylic acid grouping. 4,467,101, Cl. 549-76.000.

Kodera, Masao: *See*—
Yoshino, Yasuhisa; Kodera, Masao; Ito, Hajime; and Ohta, Hisatoshi, 4,467,313, Cl. 340-904.000.

Koga, Ituo: *See*—
Kato, Shinichi; Dohi, Yoshihiko; Motosugi, Katsuhiko; and Koga, Ituo, 4,466,395, Cl. 123-188.00M.
Kato, Shinichi; Motosugi, Katsuhiko; Isogai, Kiyoshi; Koga, Ituo; and Takita, Naka, 4,466,397, Cl. 123-188.00M.
Motosugi, Katsuhiko; Takimoto, Masatami; and Koga, Ituo, 4,466,394, Cl. 123-188.00M.
Nakanishi, Kiyoshi; and Koga, Ituo, 4,466,396, Cl. 123-188.00M.

Koharagi, Haruo: *See*—
Tahara, Kazuo; Matsui, Takayuki; Sasamoto, Hisaya; Koharagi, Haruo; Takahashi, Noriyoshi; and Takemura, Akira, 4,467,234, Cl. 310-195.000.

Kohler, Wilfried: *See*—
Mayer, Dietmar; Kramer, Horst-Dieter; Gabel, Eike; and Kohler, Wilfried, 4,467,123, Cl. 568-730.000.

Kohlpaintner, Georg: *See*—
Furst, Arpad; Bienert, Horst; and Kohlpaintner, Georg, 4,466,658, Cl. 296-223.000.

Kohn, Gustave K.; and Bamberg, Joe T., to Zoecon Corporation. Carbamates and thiocarbamates of 3-hydroxy-4-pyridyloxyphenoxy alkanoic acid esters. 4,467,092, Cl. 546-291.000.

Kohno, Tsuguo: *See*—
Matsuda, Kiyofumi; Tenjinbayashi, Koji; and Kohno, Tsuguo, 4,466,693, Cl. 350-3.600.

Koike, Mikio: *See*—
Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,466,368, Cl. 112-191.000.

Koike, Naomasa, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording sheet with improved printability and process for producing the same. 4,467,336, Cl. 346-200.000.

Kojima, Hisao. Mixing element and motionless mixer. 4,466,741, Cl. 366-339.000.

Kolb, Walter; and Weid, Helmut, to Wolfe-Gerate GmbH. Device for fastening handles, especially to domestic and gardening implements. 4,466,377, Cl. 16-114.00R.

Kolm, Eric A.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 4,467,236, Cl. 310-321.000.

Kolm, Henry H.; and Kolm, Eric A., to Piezo Electric Products, Inc. Piezoelectric acousto-electric generator. 4,467,236, Cl. 310-321.000.

Kolt, Stanley, to Suroff, Leonard W., a part interest. Automatic switch assembly. 4,466,402, Cl. 123-196.00S.

Kolycheck, Edmond G.; and Tolle, Laura L., to B. F. Goodrich Company, The. Electron beam curable polyurethane compositions. 4,467,078, Cl. 525-455.000.

Komai, Keiichi: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,466,199, Cl. 34-9.000.

Komatsu, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor resistor device. 4,467,312, Cl. 338-309.000.

Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, to Pioneer Electronic Corporation. Cassette type-tape recorder. 4,467,377, Cl. 360-96.100.

Komatsuzaki, Atsushi: *See*—
Kitagawa, Kiyoshi; and Komatsuzaki, Atsushi, 4,467,084, Cl. 528-324.000.

Konagaya, Masahiko, to Konan Camera Research Institute, Inc. Device for measuring amount of tone correction. 4,467,364, Cl. 358-280.000.

Konan Camera Research Institute, Inc.: *See*—
Konagaya, Masahiko, 4,467,364, Cl. 358-280.000.

Kondo, Kouichi; Ueda, Masahiro; and Nonoyama, Seiji, to Aisin Seiki Kabushikaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Road vehicle level controller. 4,466,625, Cl. 280-6.00R.

Kondo, Mikio; and Okabe, Kyoji, to Kawasaki Steel Corporatoa. Process for blast furnace operation. 4,466,825, Cl. 75-41.000.

Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Doi, Keiichiro; and Tanaka, Seiji, to Riccar Co., Ltd.; and Sharp Kabushiki Kaisha. Exciting arrangement for induction heating process. 4,467,162, Cl. 219-10.49R.

Kondo, Toshio: *See*—
Sakakibara, Shuji; Kondo, Toshio; Kobayashi, Akio; and Isomura, Shigenori, 4,466,410, Cl. 123-440.000.

Kondou, Nobuaki, to Nissan Motor Company, Limted. Seat with a reclining back and an armrest. 4,466,664, Cl. 297-411.000.

Konishi, Tatsuo: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.

Konishiroku Photo Industry Co., Ltd.: *See*—
Goto, Kiyoshi; Kawada, Hiroh; and Kita, Noriyasu, 4,467,025, Cl. 430-191.000.
Kishimoto, Tadao; and Tsuda, Takao, 4,466,604, Cl. 271-111.000.
Nishide, Toshikazu; Kobayashi, Akio; and Kitahata, Tamio, 4,467,029, Cl. 430-441.000.
Seimiya, Ryubun; Inowa, Shigeru; Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,467,333, Cl. 346-154.000.
Watanabe, Koji; and Yagi, Michio, 4,467,248, Cl. 315-241.00P.
Yamamoto, Takeshi; Goto, Kiyoshi; Kurita, Yoshio; Kita, Noriyasu; and Kunieda, Naoshi, 4,467,027, Cl. 430-302.000.

Koog, Wolfgang, to Texaco Development Corporation. Method of cooling product gases of incomplete combustion containing ash and char which pass through a viscous, sticky phase. 4,466,808, Cl. 48-197.00R.

Koontz, Regis A. Load setter gauge. 4,466,210, Cl. 42-90.000.

Kopel, Howard J. Hydraulic lifter train clearance control systems, elements and processes. 4,466,280, Cl. 73-118.000.

Koppers Company, Inc.: *See*—
McIntyre, Craig R.; and Eakin, Daniel A., 4,466,998, Cl. 427-297.000.

Koppl, Georg, to BBC Brown, Boveri & Company, Limited. Switching network particularly for high voltage supply systems. 4,467,221, Cl. 307-112.000.

Koppy Corporation: *See*—
Good, William K., 4,466,566, Cl. 228-155.000.

Kordomenos, Panagiotis I.; and Kurple, Kenneth R., to Ford Motor Company. Thermosetting coating composition comprising polymeric catalyst - III. 4,467,070, Cl. 525-110.000.

Korte, Wilhelm W.: *See*—
Musmann, Hans-Georg; and Korte, Wilhelm W., 4,467,316, Cl. 340-347.0DA.

Kos, Peter, to Dorr-Oliver Incorporated. Apparatus for dissolution of gases in liquid. 4,466,928, Cl. 261-76.000.

Kotch, Robert J.: *See*—
Deane, John D.; and Kotch, Robert J., 4,466,622, Cl. 277-92.000.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing glycol esters of organosilanes. 4,467,105, Cl. 556-444.000.

Koumura, Noboru: *See*—
Fujii, Motoharu; Koumura, Noboru; Sato, Yasushi; Ayata, Naoki; and Saito, Seiji, 4,467,348, Cl. 358-78.000.

Kouno, Toshio, to Dainichi Kiko Kabushiki Kaisha. Industrial robot. 4,466,307, Cl. 74-479.000.

Kovalenko, Sergei S.: *See*—
Dshkhunian, Valery L.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,467,413, Cl. 364-200.000.

Koyama, Hiroaki; and Shimizu, Shigeo, to Kanebo Ltd. Process for producing carbon articles. 4,466,932, Cl. 264-29.300.

Kramer, Gideon A.: *See*—
Kramer, Milo G.; Ballard, Albert S.; and Kramer, Gideon A., 4,466,716, Cl. 353-94.000.

Kramer, Horst-Dieter: *See*—
Mayer, Dietmar; Kramer, Horst-Dieter; Gabel, Eike; and Kohler, Wilfried, 4,467,123, Cl. 568-730.000.

Kramer, Milo G.; Ballard, Albert S.; and Kramer, Gideon A., to Source Technologies Corporation. Slide projector having two image-projection systems which operate with a single slide tray. 4,466,716, Cl. 353-94.000.

Kranz, Joachim: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.

Kratochvil, Jiri: *See*—
Ho, Nelson; Thompson, Bryan; and Kratochvil, Jiri, 4,466,879, Cl. 204-415.000.

Kratzsch, Achim: *See*—
Thrandorf, Hans-Peter; and Kratzsch, Achim, 4,466,529, Cl. 198-368.000.

Krause, Hans-Peter: *See*—
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,466,964, Cl. 424-246.000.

Krauss, Timothy A.: *See*—
Cycon, James P.; Krauss, Timothy A.; and Roman, Stephan, 4,466,774, Cl. 416-134.00A.

Krempl, Peter: *See*—
Ruckenbauer, Friedrich; and Krempl, Peter, 4,467,271, Cl. 324-56.000.

Kreuttner, Albert: *See*—
Muller, Gerhard; and Kreuttner, Albert, 4,467,208, Cl. 250-483.100.

Kriegesmann, Jochen; Lipp, Alfred; and Reinmuth, Klaus, to Elektroschmelzwerk Kempten GmbH. Dense shaped articles of polycrystalline α-silicon carbide and process for the manufacture thereof by hot-pressing. 4,467,043, Cl. 501-88.000.

Kriesten, Wolfgang: *See*—
Juretzek, Heinz; Kriesten, Wolfgang; and Sindermann, Paul, 4,466,330, Cl. 86-20.00R.

Krikor, Krikor A., to GTE Automatic Electric Inc. Circuitry for recovery of data from certain bit positions of a T1 span. 4,467,469, Cl. 370-58.000.

Kroenke, William J.; and Nicholas, Paul P., to B. F. Goodrich Company, The. Process for the oxychlorination of an alkane using a solid solution catalyst containing iron cations. 4,467,127, Cl. 570-224.000.

Kruger, Bradford E., to International Telephone & Telegraph Corporation. Rotary annular signal data coupler. 4,466,695, Cl. 350-96.200.

Krumme, Helmut: *See*—
Heinemann, Otto; Heiringhoff, Burkhard; Lucke, Helmut; Schossler, Werner; and Krumme, Helmut, 4,466,750, Cl. 384-117.000.

Krupp Polysius AG: *See*—
Beltrop, Herbert; and Teutenberg, Josef, 4,466,761, Cl. 406-74.000.
Heinemann, Otto; Heiringhoff, Burkhard; Lucke, Helmut; Schossler, Werner; and Krumme, Helmut, 4,466,750, Cl. 384-117.000.

Kubanek, George R.: *See*—
Gauvin, William H.; and Kubanek, George R., 4,466,824, Cl. 75-10.00R.

Kubota, Hiroshi: *See*—
Hatta, Tokuaki; Ueno, Haruyuki; Katsura, Yuji; Fukuda, Kazushige; Kubota, Hiroshi; and Hamamatu, Takashi, 4,467,042, Cl. 501-88.000.

Kuchera, Ray A.: *See*—
Boor, A. David; Buchovecky, Kalman E.; Cebulak, Walter S.; Kuchera, Ray A.; and White, David D., Jr., 4,466,786, Cl. 425-7.000.

Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, to Unitika Ltd. Method of manufacturing polyester fibers with good adhesion to rubber. 4,467,064, Cl. 524-114.000.

Kudo, Koji: *See*—
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.

Kuhn, Gebhard: *See*—
Meier, Ludwig; Kuhn, Gebhard; and Scharf, Klaus-Dieter, 4,466,717, Cl. 353-122.000.

Kuhnel, Frank, to VDO Adolf Schindling AG. Device for electrically monitoring the level of a liquid present in a container. 4,466,282, Cl. 73-295.000.

Kuka Wehrtechnik GmbH: *See*—
Kaustrater, Gert, 4,466,333, Cl. 89-36.00H.

Kukka, Aarre: *See*—
Tervamaki, Jukka; Kaski, Erkki; Fagerstedt, Mikael; and Kukka, Aarre, 4,466,298, Cl. 73-864.180.

Kulesza, Ralph J.; and Disko, Harry, to Marvin Glass & Associates. Impact responsive toy vehicle. 4,466,214, Cl. 446-437.000.

Kumagae, Shinichi; and Manabe, Tatsuo, to Ipposha Oil Industries, Co., Ltd. Rust inhibitor. 4,466,902, Cl. 252-391.000.

Kumahira Safe Co. Inc.: *See*—
Masachika, Hiroshi, 4,466,357, Cl. 109-66.000.

Kumar, Ajith K. N.: *See*—
Matulevich, Edward S.; Brown, Herbert J.; and Kumar, Ajith K. N., 4,467,408, Cl. 363-54.000.

Kunieda, Naoshi: *See*—
Yamamoto, Takeshi; Goto, Kiyoshi; Kurita, Yoshio; Kita, Noriyasu; and Kunieda, Naoshi, 4,467,027, Cl. 430-302.000.

Kuno, Hiroshi: *See*—
Ito, Hiroshi; Kuno, Hiroshi; and Kai, Tooru, 4,467,214, Cl. 250-563.000.

Kuo, Chang-Kiang, to Texas Instruments Incorporated. Random access MOS memory cell using double level polysilicon. 4,467,450, Cl. 365-149.000.

Kupcikevicius, Vytautas, to Union Carbide Corporation. Disk pairs inside package article for automatically and continuously making sausages with flat ends. 4,466,463, Cl. 138-118.100.

Kupcikevicius, Vytautas; and Raudys, Vytas A., to Union Carbide Corporation. Overwrapped disk pairs in a package article for automatically and continuously making sausages with flat ends. 4,466,464, Cl. 138-118.100.

Kupcikevicius, Vytautas, to Union Carbide Corporation. Article for use in automatically and continuously making stuffed casing products with flat ends. 4,466,984, Cl. 426-105.000.

Kupfer, Karl H., to U.S. Philips Corporation. Trimming capacitor. 4,467,393, Cl. 361-278.000.

Kurata, Masami: *See*—
Murayama, Tomio; Moriguchi, Fujio; Kurata, Masami; and Omori, Takashi, 4,467,365, Cl. 358-293.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakamura, Kenichi; and Obara, Hiroshi, 4,467,202, Cl. 250-338.000.

Kurihara, Michio: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,466,199, Cl. 34-9.000.

Kurisu, Norio; Matsuda, Tsutomu; Watanabe, Hideo; and Watanabe, Nobuyoshi, to Ricoh Co., Ltd. Process for the production of thermo-developable type diazo copying material. 4,467,024, Cl. 430-166.000.

Kurita, Akitsugu: *See*—
Maruyama, Kazo; and Kurita, Akitsugu, 4,467,068, Cl. 524-731.000.

Kurita, Yoshio: *See*—
Yamamoto, Takeshi; Goto, Kiyoshi; Kurita, Yoshio; Kita, Noriyasu; and Kunieda, Naoshi, 4,467,027, Cl. 430-302.000.

Kurosaki Refractories Co., Ltd.: *See*—
Hatta, Tokuaki; Ueno, Haruyuki; Katsura, Yuji; Fukuda, Kazushige; Kubota, Hiroshi; and Hamamatu, Takashi, 4,467,042, Cl. 501-88.000.

Kurosu, Hirohiko; Nagata, Satoshi; and Satake, Yasuo, to Fujitsu Limited. High-speed external memory system. 4,467,454, Cl. 365-189.000.

Kurozumi, Seizi: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.

Kurple, Kenneth R.: *See*—
Kordomenos, Panagiotis I.; and Kurple, Kenneth R., 4,467,070, Cl. 525-110.000.

Kusabe, Kouji: *See*—
Matsuura, Ryo; Nagaoka, Kazuya; Kusabe, Kouji; and Nakatani, Shuichi, 4,467,112, Cl. 562-493.000.

Kusters, Eduard: *See*—
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Gess, Larry C., 4,466,228, Cl. 53-553.000.

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Leikert, Klaus; and Michelfelder, Sigfrid, 4,466,363, Cl. 110-347.000.

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Cantou, Christian, 4,467,357, Cl. 358-148.000.

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Tervamaki, Jukka; Kaski, Erkki; Fagerstedt, Mikael; and Kukka, Aarre, 4,466,298, Cl. 73-864.180.

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Gross, Thomas A. O.; Lalumiere, Edward; and Arzberger, William A., 4,467,222, Cl. 307-115.000.
Lam, Calvin K. Capacitance manometer with digital output. 4,466,289, Cl. 73-724.000.
Lamaster, Donald M., to Emerson Electric Co. Variable speed motor drive system. 4,467,261, Cl. 318-810.000.
Lamatsch, Hans; Schmidt, Helmut; Ulrich, Bodo; and Braungardt, Karl-Heinz, to Siemens Aktiengesellschaft. Stator for an electric polyphase motor. 4,466,182, Cl. 29-596.000.
Lamb, Joe H. Swimming pool cover leading edge wheel assembly. 4,466,143, Cl. 4-502.000.
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Lamothe, Frederick H., II. Optical fluid lens. 4,466,706, Cl. 350-419.000.
Lane, Wendell C., to Dana Corporation. Plate locating apparatus for multiple disc clutch. 4,466,524, Cl. 112-70.250.
Lang, Warren R., to Sperry Corporation. CRT Color purity adjustment apparatus. 4,467,302, Cl. 335-212.000.
Lang, William H.: *See—*
Chang, Clarence D.; and Lang, William H., 4,467,133, Cl. 585-733.000.
Langdon, Glen G., Jr.; and Rissanen, Jorma J., to International Business Machines Corporation. High-speed arithmetic compression coding using concurrent value updating. 4,467,317, Cl. 340-347.0DD.
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Bauer, Karlheinz; Langenbeck, Andreas; Pfeiffer, Peter; and Tomforde, Johann, 4,467,402, Cl. 362-32.000.
Langof, Igor: *See—*
Jenko, Branko; and Langof, Igor, 4,467,093, Cl. 546-321.000.
Large, Donald M.: *See—*
Beltz, Richard K.; Large, Donald M.; and Leffel, Daniel D., 4,466,852, Cl. 156-344.000.
Larkin, Larry C. Bicycle spark wheel. 4,466,630, Cl. 280-289.00D.
La Rose, Thom. Home video game storage unit. 4,466,674, Cl. 312-250.000.
Larsen, Robert H., to Singer Company, The. Threading arrangement for a sewing machine. 4,466,371, Cl. 112-302.000.
Larson, Myles A.: *See—*
Jones, Gary P.; and Larson, Myles A., 4,467,277, Cl. 324-78.00R.
Larsson, Carl R. Method and an arrangement for storing organic fibrous material in a stack. 4,466,201, Cl. 34-27.000.
Laskaris, Evangelos T., to General Electric Company. Superconducting magnet having a support structure for ring-shaped superconductive coils. 4,467,303, Cl. 335-216.000.
Lassaux, Jean, to Telecommunication Radioelectriques et Telephoniques. Echo canceller utilizing pseudo-logarithmic encoding law. 4,467,146, Cl. 179-170.200.
Latin Percussion, Inc.: *See—*
Cohen, Martin B., 4,466,596, Cl. 248-635.000.
Lauermann, Georg; Scholz, Siegfried; and Koch, Ferdinand, to Henkel Kommanditgesellschaft auf Aktien. Preparation for udder care and disinfection for dairy animals. 4,466,959, Cl. 424-150.000.
Lauraire, Michel: *See—*
Belbel, Elie; Fechant, Louis; Haury, Andre ; Lauraire, Michel; and Siffroi, Lucien, 4,467,298, Cl. 335-16.000.
Lawrence, Frederick J., to Gradco Systems, Inc. Compact sheet sorter. 4,466,609, Cl. 271-293.000.
Layton, Howard M., to Interlab, Inc. Automated work transfer system. 4,466,454, Cl. 134-76.000.
Learned, Edward B.: *See—*
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Lee, Biing-Lin, to B. F. Goodrich Company, The. Heterogeneous rubber having low air diffusion. 4,467,060, Cl. 523-353.000.
Lee, John T. M., to ICI Americas Inc. Self-contained fire protection apparatus. 4,466,489, Cl. 169-26.000.
Lee, Ronald B.: *See—*
Citta, Richard W.; and Lee, Ronald B., 4,467,353, Cl. 358-120.000.
Lee, Sukoo. Surgical stapler. 4,466,436, Cl. 128-326.000.
Leeds, Robert. Method of therapy for oral herpes simplex. 4,466,956, Cl. 424-80.000.
Leesona Corporation: *See—*
Brouwer, Charles W.; Cowan, Larry C.; Horton, Robert; and Wueger, Karl W., 4,466,468, Cl. 139-435.000.
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Lehman, James A. Inflatable saucer toy with shape holders and weights. 4,466,212, Cl. 446-46.000.
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Leitermann, Richard; and Wilson, Bruce G., to Digital Equipment Corporation. Electronic keyboard. 4,467,150, Cl. 200-5.00A.
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Jenko, Branko; and Langof, Igor, 4,467,093, Cl. 546-321.000.
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Lemelson, Jerome H. Electronic digital watch. 4,466,742, Cl. 368-10.000.
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Faas, Harald; Lenzen, Ditrich; Weik, Hans; Ostermann, Albrecht; and Reimann, Wolfgang, 4,466,817, Cl. 55-455.000.
Leonard, Ralph W., to United States Steel Corporation. Atmospheric gas practice for hot-dip coating of metals. 4,466,999, Cl. 427-329.000.
Leonardo, Ignazio, to Diamond Communication Products, Inc. Cable television tap bracket or the like. 4,466,589, Cl. 248-61.000.
Leritz, James P. Velocipede. 4,466,626, Cl. 280-12.140.
Lermann, Peter; Cocron, Istvan; and Fauth, Gunter, to Agfa-Gevaert AG. Automatic exposure control for automatic-focus cameras. 4,466,718, Cl. 354-408.000.
Lerner, Hershey; and Waitz, Harold, to Automated Packaging Systems, Inc. Non-migrating control indicia for a plastic web or sheet article. 4,467,207, Cl. 250-459.100.
Lessard, Philip A.: *See—*
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Leung, Kam F. Closure device. 4,466,551, Cl. 220-293.000.
Leupold, Gerhard; and Hoppert, Hans, to Draloric Electronic GmbH. Monolithic capacitor and method of manufacturing it. 4,467,396, Cl. 361-321.000.
Leuthen, John M., to Hughes Tool Company. Power factor correction for variable speed drive. 4,467,258, Cl. 318-800.000.
Leuthold, Karl; Mitzel, Wilhelm; and Haberstroh, Markus, to GAO Gesellschaft fur Automation und Organisation mbH. Stacking device for sheet material. 4,466,605, Cl. 271-177.000.
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Wooten, Ronald E.; Lehne, John; and Kwan, Gerald A., 4,466,644, Cl. 292-263.000.
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Appel, Peter W.; Den Outer, Robert D.; Schutter, Klaas; and Broekhoff, Johan C. P., 4,466,897, Cl. 252-108.000.
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Lewkowitz, Bernd. Grill insert clip. 4,466,220, Cl. 52-127.600.
Lewyn, Lanny L.; and Lucas, Charles H., to Hughes Aircraft Company. Channel charge compensation switch with first order process independence. 4,467,227, Cl. 307-577.000.
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Siewert, G. A. Horst; Dietrich, Horst; Munz, Wolf-Dieter; and Goebel, Jorg, 4,466,940, Cl. 420-507.000.
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Marten, Peter; and Weidel, Edgar, 4,467,276, Cl. 324-77.00R.
Musmann, Hans-Georg; and Korte, Wilhelm W., 4,467,316, Cl. 340-347.0DA.
Rupp, Dieter; Weeber, Wolfgang; Lissner, Paul; and Steimle, Josef, 4,467,142, Cl. 179-5.00R.
Liebel, Henry L., to Angleboard Inc. Slip sheet. 4,467,004, Cl. 428-81.000.
Liebert, Karl-Heinz; Fassbender, Rolf; and Tischer, Werner, to Zahnradfabrik Friedrichshafen, A.G. Hydrostatic power steering system with curved valve return springs. 4,466,243, Cl. 60-384.000.
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Heinz, Focke; and Liedtke, Kurt, 4,466,577, Cl. 242-58.000.
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Lin, Henry C.; and Cotter, Byron R., to Occidental Chemical Corporation. Method for the preparation of 2-(trifluoromethyl)phenyl carbamic fluoride. 4,466,927, Cl. 260-544.00C.
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Kaldenbach, Erwin, 4,466,345, Cl. 100-19.00R.
Lindsay, Richard A.: *See—*
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Linear Pneumatics Inc.: *See—*
Hoffman, Brent K., 4,466,167, Cl. 29-275.000.
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Lingner & Fischer GmbH: *See—*
Hechenberger, Dieter A.; and Gollub, Hans J., 4,467,079, Cl. 526-90.000.
Linke, Hans-Ralf: *See—*
Kleinhammer, Gerd; Deutsch, Gerlinde; Linke, Hans-Ralf; Stahler, Fritz; and Gruber, Wolfgang, 4,467,030, Cl. 435-7.000.
Lion Corporation: *See—*
Ichikawa, Hiromichi; Saso, Kazuo; and Suganuma, Nobuo, 4,466,954, Cl. 424-50.000.
Lipp, Alfred: *See—*
Kriegesmann, Jochen; Lipp, Alfred; and Reinmuth, Klaus, 4,467,043, Cl. 501-88.000.

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List, Hans: *See*—
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Jones, Arnold H.; and Grissom, Donald L., 4,467,153, Cl. 200-61.45R.

Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, to Merck & Co., Inc. 1-Hydroxyethyl-2-amino pentanedioic acid derivatives. 4,467,107, Cl. 560-170.000.

Livny, Avinoam: *See*—
Yarnitsky, Yashaya; and Livny, Avinoam, 4,466,555, Cl. 221-224.000.

Loader, Brian K. Valves for controlling dispensation of fluid material. 4,466,559, Cl. 222-196.000.

Lob, Erwin: *See*—
Maurer, Thomas; Lob, Erwin; and Schweiger, Peter, 4,467,209, Cl. 235-487.000.

Locker, Donald H.: *See*—
Bennington, James E.; Boerma, Michael J.; Brakora, Anthony J.; Locker, Donald H.; and Rhoades, Terence J., 4,466,294, Cl. 73-862.130.

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Heilman, Robert R.; and McElroy, Howard J., 4,466,641, Cl. 285-406.000.

Lockhart, Thomas P., to General Electric Company. One package, stable, moisture curable, alkoxy-terminated organopolysiloxane compositions. 4,467,063, Cl. 524-106.000.

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Huang, Cheng-Chung; and Chang, Tao, 4,466,738, Cl. 356-4.500.

Lockwood, C. W., Jr. Solar collector system for standing seam roofs. 4,466,424, Cl. 126-452.000.

Loessel, Mark C., to Whirlpool Corporation. Thermal range control. 4,467,184, Cl. 219-506.000.

Logan, Emanuel L., Jr.; and Walsh, J. William. Emergency exit sign utilizing an electro-luminescent (EL) lamp and a brightness monitor. 4,466,208, Cl. 40-544.000.

Long, Barry W.; Roush, David H., deceased; and by Roush, Vivian J., heir. Wide fabric manufacturing method and apparatus. 4,466,163, Cl. 28-170.000.

Longton, John: *See*—
Towersey, Peter J.; Longton, John; and Cockram, Geoffrey N., 4,466,988, Cl. 426-656.000.

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Lord Corporation: *See*—
Dawdy, Terrance H., 4,467,071, Cl. 525-112.000.
Gounder, Raj N.; and Geary, John T., 4,467,100, Cl. 548-429.000.

L'Oreal: *See*—
Bugaut, Andree; and Andrillon, Patrick, 4,466,806, Cl. 8-414.000.

Loscher, Lothar W.; Hoogeveen, Frank; and Hanselmann, Gerd, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Apparatus for producing a cavity in a bone. 4,466,429, Cl. 128-92.00E.

Lotrous, Robert; and Darbois, Paul, to Plastiques Industriels Thecla. Merchandizing package. 4,466,540, Cl. 206-387.000.

Lowke, George E.; and Meltzer, Robert J., to Warner-Lambert Company. Identification and enumeration of microbial cells. 4,467,032, Cl. 435-34.000.

Lubrizol Corporation, The: *See*—
Grover, Kent B., 4,466,894, Cl. 252-32.70E.
Schroeck, Calvin W., 4,466,895, Cl. 252-32.70E.

Lucas, Charles H.: *See*—
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Page, Kenneth, 4,466,391, Cl. 123-145.00A.

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Heinemann, Otto; Heiringhoff, Burkhard; Lucke, Helmut; Schossler, Werner; and Krumme, Helmut, 4,466,750, Cl. 384-117.000.

Ludeman, Michael M.: *See*—
Eby, John C., Jr.; Cauthron, David L.; Ludeman, Michael M.; and Hicks, James R., 4,467,354, Cl. 358-133.000.

Lund, Richard B.; and Brown, Glenn W., to Ciba-Geigy Corporation. Process for the production and purification of 2,4,4'-trichloro-2'-hydroxydiphenylether. 4,467,117, Cl. 568-637.000.

Lundin, Borje R., to ESAB AB. Welding head for narrow gap welding. 4,467,173, Cl. 219-125.120.

Lustig, Claude D., to Sperry Corporation. Electro-optically addressed flat panel display. 4,467,325, Cl. 340-794.000.

Lyman, John B., to Whirlpool Corporation. Vacuum cleaner hose manufacture. 4,466,677, Cl. 339-15.000.

Lynell Medical Technology Inc.: *See*—
Poler, Stanley, 4,466,858, Cl. 156-643.000.

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Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Neberle, Klaus; Ochs, Heinrich; and Schwebe, Gunter, 4,466,347, Cl. 101-148.000.

Maas-Rowe Carillons, Inc.: *See*—
Hayward, Gamon B., 4,466,329, Cl. 84-406.000.

Mabie, Earl. Movable backrest for tandem seat motorcycles. 4,466,660, Cl. 297-195.000.

MacCormack, Alexander A., to Emerson Electric Co. Temperature compensated resistance test board. 4,467,279, Cl. 324-158.0MG.

MacCracken, Calvin D. Ground-installed coldness storage and utilization system. 4,466,256, Cl. 62-260.000.

MacDonald, Robert I., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Wavelength selective optical coupler. 4,466,694, Cl. 350-96.190.

MacDougall, Frederick W., to Aerovox Incorporated. Capacitor resistor. 4,467,392, Cl. 361-275.000.

Machl, Franz: *See*—
Resch, Heinz; Machl, Franz; Kerschbaumer, Klaus; and Ullrich, Helmut, 4,467,141, Cl. 179-2.0EA.

Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, to Rhone-Poulenc Chimie de Base. Filled polymeric compositions comprising novel polymer/filler interfacing additive. 4,467,055, Cl. 523-200.000.

Maciel, Robert F.: *See*—
DiNitto, Robert G.; Harris, John C.; and Maciel, Robert F., 4,466,878, Cl. 204-415.000.

MacLaughlin, Donald N.; and Fortuna, Vincent E., to Cosden Technology, Inc. Gripper for capsule welder. 4,466,844, Cl. 156-69.000.

MacLaurin, Andrew D.: *See*—
Money, David K.; and MacLaurin, Andrew D., 4,466,440, Cl. 128-419.0PG.

MacLean, John P., to Texaco Inc. Method of transferring heat between two fluids and heat exchange tube. 4,466,479, Cl. 165-1.000.

Maddak, Inc.: *See*—
Matey, Edward J., 4,466,309, Cl. 74-551.900.

Maddox, William J., to RCA Corporation. System for applying a high voltage source to a CRT through a capacitive load. 4,467,224, Cl. 307-270.000.

Maddrick, Bernard D., to Bendix Limited. Variable pressure ratio valve for vehicle braking system having double valve assembly set as function of vehicle load. 4,466,672, Cl. 303-22.00R.

Madson, Michael A.: *See*—
Mawhinney, Thomas P.; and Madson, Michael A., 4,467,037, Cl. 436-89.000.

Maeda, Katsuhiko: *See*—
Harasawa, Isamu; Hariki, Yukio; Maeda, Katsuhiko; and Nakamura, Koichi, 4,467,035, Cl. 435-253.000.

Maeda, Koichi; and Ito, Haruo, to Hewlett-Packard Company. DC characteristics measuring system. 4,467,275, Cl. 324-73.0AT.

Maehara, Yoshimi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,466,585, Cl. 242-199.000.

Magami, Masato; Sato, Toshio; Katayama, Sakae; and Umekawa, Osamu, to Yoshitomi Pharmaceutical Industries, Ltd.; and Katayama Chemical Works Co., Ltd. Microbicidal/microbistatic compositions for industrial use. 4,466,975, Cl. 424-270.000.

Magennis, Steven A.: *See*—
Chalk, Alan J.; Magennis, Steven A.; Wertheimer, Vasile S.; and Naipawer, Richard E., 4,467,118, Cl. 568-687.000.

Maggi, Carlo. Operating table for ophthalmic surgery. 4,466,425, Cl. 128-1.00R.

Magnusson, Karl G., to Saab-Scania Aktiebolag. Method of preventing erroneous gear selection in an automatic gear selection system in vehicles. 4,467,427, Cl. 364-424.100.

Mahler, Allan K.: *See*—
Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., 4,466,643, Cl. 292-92.000.

Maie, Hiroyuki: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.

Maier, Manfred: *See*—
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Tsuruoka, Takashi; Imai, Satoshi; Satoh, Atsuyuki; Watanabe, Tetsuro; Watanabe, Koji; Inouye, Shigeharu; and Niida, Taro, 4,466,913, Cl. 260-112.50R.

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Schill, Hermann, 4,466,344, Cl. 99-589.000.

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Chan, Keng S.; and Majoros, Stephen J., 4,466,892, Cl. 252-8.55D.

Mallick, George T., Jr.; and Maynard, Pamela M., to Westinghouse Electric Corp. Motor control apparatus with rotor heating protection. 4,467,260, Cl. 318-800.000.

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Kumagae, Shinichi; and Manabe, Tatsuo, 4,466,902, Cl. 252-391.000.

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Camboulives, AndreA. M. L.; and Mandet, Gerard M. F., 4,466,573, Cl. 239-265.410.

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Wessel, Otto, 4,466,265, Cl. 72-97.000.

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McDonald, Alexander B.; and Mannix, Joseph T., 4,466,662, Cl. 297-406.000.

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Henery, Maurice D.; Kerwin, John M.; and Walker, Walter W., 4,466,361, Cl. 110-346.000.

March, Edward J.: *See*—
Jacobs, Brian E.; and March, Edward J., 4,466,791, Cl. 432-23.000.

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Marchadour, Yves; and Marchadour, Jean-Charles, 4,466,557, Cl. 222-144.000.

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Mark, Victor; and Hedges, Charles V., to General Electric Company. Fluorinated diphenols and method for their preparation. 4,467,121, Cl. 568-726.000.

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Knabel, Walter; and Wagner, Ludwig, 4,466,634, Cl. 280-632.000.

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Kulesza, Ralph J.; and Disko, Harry, 4,466,214, Cl. 446-437.000.

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Stout, David M.; and Matier, William L., 4,466,965, Cl. 424-250.000.

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Klatt, John H.; and Matsko, Theodore N., 4,466,383, Cl. 122-379.000.

Matson, Robert P., Sr. Apparatus for straightening vehicle. 4,466,268, Cl. 72-389.000.

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Ogawa, Kazufumi, 4,467,026, Cl. 430-296.000.
Ogura, Takeshi; Tamura, Kimimaro; and Okuma, Yoshikazu, 4,466,326, Cl. 84-1.220.
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Ross, Gunther; and Schiementz, Manfred, 4,466,190, Cl. 33-1.00M.

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Birr, Christian; and Stollenwerk, Ulrich, 4,466,918, Cl. 260-112.50R.

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May, Richard L., to Allen Group, Inc. Twin beam portable light assembly. 4,467,403, Cl. 362-250.000.

Mayer, Dietmar; Kramer, Horst-Dieter; Gabel, Eike; and Kohler, Wilfried, to Bayer Aktiengesellschaft. Process for the preparation of alkali metal diphenylates and free hydroxydiphenyls. 4,467,123, Cl. 568-730.000.

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Mallick, George T., Jr.; and Maynard, Pamela M., 4,467,260, Cl. 318-800.000.

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Heilman, Robert R.; and McElroy, Howard J., 4,466,641, Cl. 285-406.000.

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Ritchie, John A., 4,467,266, Cl. 320-40.000.

McIntyre, Craig R.; and Eakin, Daniel A., to Koppers Company, Inc. Wood impregnation. 4,466,998, Cl. 427-297.000.

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Clark, Albert R.; Ernst, William A.; Mitrovich, Svetislav; and Self, James E., 4,466,607, Cl. 271-225.000.

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Shang, Jer-Yu; Mei, Joseph S.; Slagle, Frank D.; and Notestein, John E., 4,466,360, Cl. 110-264.000.

Meier, Ludwig; Kuhn, Gebhard; and Scharf, Klaus-Dieter, to Jenoptik Jena GmbH. Optical system for lantern slide projection. 4,466,717, Cl. 353-122.000.

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Gable, Stewart V.; Glover, Robert N.; King, Francis G.; and Meier, Raymond C., Jr., 4,466,279, Cl. 73-117.000.

Mein, Peter G., to Carus Corporation. Process for recovering cesium from cesium alum. 4,466,950, Cl. 423-599.000.

Meindl, Gerhard, to Siemens Aktiengesellschaft. Soldering lug for mounting electrical conducting wires. 4,466,681, Cl. 339-97.00R.

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Menton, Jack K. Swing throw crank structure. 4,466,403, Cl. 123-197.0AC.

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Batteux, Pierre, 4,466,691, Cl. 339-272.00R.
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Baier, Robert E.; King, Raymond W.; and Meyer, Anne E., 4,466,277, Cl. 73-61.200.

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Jones, David B.; and Powell, Brian D., 4,466,145, Cl. 5-82.00R.

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Mizuno, Kotaro: *See*—
Okamoto, Eisaku; and Mizuno, Kotaro, 4,466,324, Cl. 84-1.030.
Mizuno, Takaji; Kato, Yoshsaki; and Shimizu, Takao, to Mitsubishi Denki Kabushiki Kaisha. Hot-wire arc welding apparatus. 4,467,176, Cl. 219-137.710.
Mizusaki, Takashi: *See*—
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Mizutare, Katsuhiko: *See*—
Tahara, Susumu; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Mizutare, Katsuhiko, 4,467,109, Cl. 560-193.000.
Mo och Domsjo Aktiebolag: *See*—
Hultman, Bengt G.; and Nilsson, Rolf C., 4,466,861, Cl. 162-38.000.
Mobay Chemical Corporation: *See*—
Phillips, Walter J.; and Rawlings, Herbert L., 4,466,912, Cl. 252-512.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A.; Dickert, Joseph J., Jr.; and Fowles, Patrick E., 4,466,882, Cl. 208-11.00R.
Braid, Milton, 4,466,925, Cl. 260-439.00R.
Chang, Clarence D.; and Lang, William H., 4,467,133, Cl. 585-733.000.
Huggard, Mark T., 4,466,933, Cl. 264-54.000.
Shu, Winston R., 4,466,485, Cl. 166-272.000.
Modulite Corporation: *See*—
Weber, Franz K., 4,467,405, Cl. 362-352.000.
Moery, Ronald J.: *See*—
Fox, James W.; Moery, Ronald J.; and Banas, Kenneth P., 4,467,161, Cl. 200-281.000.
Molders, Werner; Freitag, Herbert; and Smith, Lawther O., to Stabilus GmbH. Cylinder-piston device. 4,466,514, Cl. 188-320.000.
Moller, Heinz: *See*—
Hartung, Erwin; Klenk, Martin; and Moller, Heinz, 4,466,406, Cl. 123-425.000.
Mollier, Jean H., to Compagnie Internationale pour l'Informatique Cii Honeywell Bull. Process and system for transmission of signed messages. 4,467,139, Cl. 178-22.080.
Money, David K.; and MacLaurin, Andrew D., to Telectronics Pty. Ltd. Heart pacer time-domain processing of internal physiological signals. 4,466,440, Cl. 128-419.0PG.
Monsanto Company: *See*—
Chupp, John P.; and Alt, Gerhard H., 4,467,125, Cl. 568-936.000.
Weingarten, Harold I., 4,466,919, Cl. 260-112.50R.
Montedison S.p.A.: *See*—
Conti, Natale; and Tardani, Massimo, 4,467,054, Cl. 521-188.000.
Montei, Harold R.: *See*—
Cuneo, Edward A.; Montei, Harold R.; and Olivieri, Michael, 4,466,184, Cl. 29-830.000.
Montgomery, James W., to Hughes Tool Company. Sandwich shaped piston seal. 4,466,617, Cl. 277-4.000.
Montiero, Richard, to RM Industries, Inc. Adjustable interior pipe cutter. 4,466,185, Cl. 30-103.000.
Moore, Bobby O.: *See*—
Hjorth, Richard N.; Moore, Bobby O.; and Grant, Norman H., 4,466,957, Cl. 424-89.000.
Moore, John H. Device and method for inducing bradycardia. 4,466,439, Cl. 128-402.000.
Morawski, Jean-Claude: *See*—
Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,467,055, Cl. 523-200.000.
Moren, Lars G.; and Berg, Ulf P., to Aktiebolaget Electrolux. Self starting reluctance motor. 4,467,233, Cl. 310-162.000.
Morgan, George M.; and Hinkens, Dale R., to Creative Glassworks International. Method of cutting glass with a laser and an article made therewith. 4,467,168, Cl. 219-121.0LG.
Mori, Chuzo, to Carl Manufacturing Co., Ltd. Punch for office use. 4,466,322, Cl. 83-468.000.
Mori, Ichiro: *See*—
Sugihara, Kazuyoshi; Tojo, Toru; Mori, Ichiro; and Shinozaki, Toshiaki, 4,467,210, Cl. 250-492.200.
Mori, Sumio, to Fuji Photo Film Co., Ltd. Adaptive quantizer. 4,467,346, Cl. 358-12.000.
Mori, Yukiyoshi, to Toray Industries, Inc. Process for continuously producing carbon fibers. 4,466,949, Cl. 423-447.400.
Moriguchi, Fujio: *See*—
Murayama, Tomio; Moriguchi, Fujio; Kurata, Masami; and Omori, Takashi, 4,467,365, Cl. 358-293.000.
Morimoto, Hiroyuki, to Shindaiwa Kogyo Company, Ltd. Portable circular saw. 4,466,187, Cl. 30-124.000.
Morishita, Hikozo, to Mitsubishi Denki Kabushiki Kaisha. High voltage current transformer having coils immersed in dielectric fluid. 4,467,306, Cl. 336-58.000.
Morishita, Satoru: *See*—
Takaishi, Tetsuo; Itabashi, Keiji; Morishita, Satoru; and Hatotani, Hisashi, 4,466,812, Cl. 55-68.000.
Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, to Kabushiki Kaisha Kobe Seiko Sho. Heater for hot isostatic pressing apparatus. 4,467,185, Cl. 219-539.000.

Morrill, Albin H.: *See*—
Svendsgaard, Roger W., 4,466,188, Cl. 30-172.000.
Morris, Hugh C., to Caterpillar Tractor Co. Circuitous path flow restrictor. 4,466,462, Cl. 138-42.000.
Morrison, Lester M. Food supplement. 4,466,958, Cl. 424-127.000.
Mort, Joseph: *See*—
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Morwing, Bo A.: *See*—
Charas, Philip M.; Gustavsson, Per-Olof G.; and Morwing, Bo A., 4,467,326, Cl. 343-6.50R.
Moschl, Gernot: *See*—
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Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., to Package Machinery Company. Combination weighing system. 4,466,500, Cl. 177-1.000.
Mosher, Oren G.: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,466,500, Cl. 177-1.000.
Moss, Theron C.; Boring, Earl; and Tomm, Irwin, to Seco Industries, Inc. Bowl mop. 4,466,152, Cl. 15-229.00A.
Motohashi, Shoji: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.
Motorola, Inc.: *See*—
Neely, Eric D., 4,467,223, Cl. 307-254.000.
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Motosugi, Katsuhiko; Takimoto, Masatami; and Koga, Ituo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control device of a helically-shaped intake port. 4,466,394, Cl. 123-188.00M.
Motosugi, Katsuhiko: *See*—
Kato, Shinichi; Dohi, Yoshihiko; Motosugi, Katsuhiko; and Koga, Ituo, 4,466,395, Cl. 123-188.00M.
Kato, Shinichi; Motosugi, Katsuhiko; Isogai, Kiyoshi; Koga, Ituo; and Takita, Naka, 4,466,397, Cl. 123-188.00M.
Moyer, Norman E., to Hughes Aircraft Company. Nonvolatile random access memory cell. 4,467,451, Cl. 365-156.000.
Mozingo, Melvin B.: *See*—
Smith, Robert L.; and Mozingo, Melvin B., 4,467,423, Cl. 364-400.000.
Mross, James J.; Traeder, Howard F.; and Seidl, Robert M., to General Motors Corporation. Gyro bearing assembly. 4,466,299, Cl. 74-5.700.
Mueller, Mark W.; Parker, Thomas S.; Benignus, Douglas M.; and Frye, James L., to International Business Machines Corporation. Communication adapter circuit. 4,467,445, Cl. 364-900.000.
Mueller, Robert S., to Eaton Corporation. Engagement modulator for torque converter bypass. 4,466,518, Cl. 192-3.290.
Muetzel, Wolfgang: *See*—
Hilmann, Juergen; Hoffmann, Rolf-Ruediger; Muetzel, Wolfgang; and Zimmermann, Ingfried, 4,466,442, Cl. 128-653.000.
Muhlbauer, Reinhard. High-pressure liquid injection system. 4,466,571, Cl. 239-101.000.
Mukaeda, Satoshi, to Nissan Motor Company, Limited. Air passageway to air injection valve for gas turbine engine. 4,466,250, Cl. 60-737.000.
Muller, Gerhard; and Kreuttner, Albert, to Carl-Zeiss-Stiftung, Heidenheim/Brenz, d/b/a Carl Zeiss, Oberkochen. Radiation sensor containing fluorescible material. 4,467,208, Cl. 250-483.100.
Muller, Roman: *See*—
Oetiker, Hans; and Muller, Roman, 4,466,542, Cl. 209-44.200.
Mullersman, Ferdinand H.: *See*—
Blake, Charles R.; and Mullersman, Ferdinand H., 4,467,264, Cl. 320-2.000.
Mulot, Georges; and Mulot nee Crubilhe, Suzette. Magazine for underwater crossbow string functioning by depression. 4,466,417, Cl. 124-25.000.
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Mulot, Georges; and Mulot nee Crubilhe, Suzette, 4,466,417, Cl. 124-25.000.
Mumford, Eustace H.: *See*—
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Munz, Wolf-Dieter: *See*—
Siewert, G. A. Horst; Dietrich, Horst; Munz, Wolf-Dieter; and Goebel, Jorg, 4,466,940, Cl. 420-507.000.
Murakami, Jyoji; and Watanabe, Tsuyoshi, to Fujitsu Limited. One-chip microcomputer. 4,467,420, Cl. 364-200.000.
Murakami, Tadaki: *See*—
Murakami, Yoshihiro; Takeuchi, Toyoshi; Ishii, Isao; Murakami, Tadaki; and Takayanagi, Hiroshi, 4,466,793, Cl. 432-253.000.
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Muranaka, Fumio: *See*—
Hamada, Masato; Ohmura, Jukichi; and Muranaka, Fumio, 4,466,881, Cl. 204-59.00F.
Murase, Isao; and Hirose, Katsutoshi, to Nissan Motor Co., Ltd. Flame photometric detector analyzer. 4,466,943, Cl. 422-91.000.
Murase, Shigemitsu: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,467,064, Cl. 524-114.000.
Murata, Makoto: *See*—
Okada, Tadashi; Furukawa, Yuji; and Murata, Makoto, 4,466,635, Cl. 280-661.000.
Murayama, Tomio; Moriguchi, Fujio; Kurata, Masami; and Omori, Takashi, to Fuji Xerox Co., Ltd. Control system for reading device. 4,467,365, Cl. 358-293.000.
Murmann, Gunter; and Bauer, Gunter, to Cherry Electrical Products Corporation. Low profile switch. 4,467,160, Cl. 200-159.00A.
Murphey, Joseph R., to Halliburton Company. Rapidly dissolvable silicates and methods of using the same. 4,466,831, Cl. 106-74.000.
Murphy, Robert E., to J-U-B Engineers, Inc. Multiple fixed hydraulic geometry turbine control system. 4,467,216, Cl. 290-43.000.
Murray, William M. Bone cement nozzle and method. 4,466,435, Cl. 128-303.00R.
Musmann, Hans-Georg; and Korte, Wilhelm W., to Licentia Patent-Verwaltungs-GmbH. Generalized interpolative method for digital-/analog conversion of PCM signals. 4,467,316, Cl. 340-347.0DA.
Mustang Trip saver, Inc.: *See*—
Jones, Kenneth R., 4,466,496, Cl. 175-67.000.
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Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.
Nagaoka, Kazuya: *See*—
Matsuura, Ryo; Nagaoka, Kazuya; Kusabe, Kouji; and Nakatani, Shuichi, 4,467,112, Cl. 562-493.000.
Nagaoka, Shinji; and Sato, Koji, to Seiko Koki Kabushiki Kaisha. Shutter control circuit equipped with a flash light control signal circuit. 4,466,727, Cl. 354-417.000.
Nagasawa, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Darlington complementary circuit for preventing zero crossover distortion. 4,467,226, Cl. 307-315.000.
Nagashima, Hideyuki: *See*—
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Nagata, Satoshi: *See*—
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Nagel, Erich: *See*—
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Nagle, Dennis C.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,466,996, Cl. 427-122.000.
Nagy, George, Jr.: *See*—
Dvorak, Edwin A.; Nagy, George, Jr.; Puscasu, Boris; and Pniewski, Gary A., 4,467,156, Cl. 200-84.00R.
Naipawer, Richard E.: *See*—
Chalk, Alan J.; Magennis, Steven A.; Wertheimer, Vasile S.; and Naipawer, Richard E., 4,467,118, Cl. 568-687.000.
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, to Electric Power Development Co., Ltd.; and Kawasaki Jukogyo Kobushiki Kaisha. Dehydration process for organic solid material. 4,466,199, Cl. 34-9.000.
Nakajima, Koe: *See*—
Yada, Hiroshi; Matsumura, Yoshikazu; and Nakajima, Koe, 4,466,842, Cl. 148-12.00R.
Nakajima, Seiichiro: *See*—
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Nakajima, Toyohei: *See*—
Hasegawa, Shumpei; and Nakajima, Toyohei, 4,466,411, Cl. 123-480.000.
Nakajima, Yukio, to Olympus Optical Co., Ltd. In-focus indicator for a camera. 4,466,726, Cl. 354-409.000.
Nakamichi Corporation: *See*—
Uchikoshi, Gohji, 4,467,319, Cl. 340-347.0DA.
Nakamura, Akira: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,466,199, Cl. 34-9.000.
Nakamura, Kenichi; and Obara, Hiroshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Photoelectric detector. 4,467,202, Cl. 250-338.000.
Nakamura, Koichi: *See*—
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Nakamura, Kousuke: *See*—
Matsushita, Yasuo; Nakamura, Kousuke; and Ura, Mitsuru, 4,467,309, Cl. 338-22.00R.
Nakamura, Shigeo: *See*—
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Nakanishi, Kiyoshi; and Koga, Ituo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control device of a helically-shaped intake port. 4,466,396, Cl. 123-188.00M.

Nakanishi, Kiyoshi; Okumura, Takeshi; and Inoue, Tokuta, to Toyota Jidosha Kabushiki Kaisha. Flow control device of a helically-shaped intake port. 4,466,398, Cl. 123-188.00M.
Nakano, Teruyuki: *See*—
Asaka, Urataro; Nakano, Teruyuki; Miyazawa, Shinkichi; and Masuda, Shoji, 4,466,409, Cl. 123-433.000.
Nakata, Takeshi; Takase, Hitoshi; and Horinouchi, Atsushi, to Sanyo Electric Co., Ltd. Electronic controlled heat cooking apparatus and method of controlling thereof. 4,467,164, Cl. 219-10.55M.
Nakatani, Shuichi: *See*—
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Nakazima, Takeaki: *See*—
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Nalco Chemical Company: *See*—
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Namba, Akihiro: *See*—
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Napoli, Phillip D.; Harris, Robert W.; and Brisken, Thomas A., to General Electric Company. Gas turbine engine with improved air cooling circuit. 4,466,239, Cl. 60-39.020.
Narita, Masanori, to Nissan Motor Co., Ltd. Automotive seat. 4,466,661, Cl. 297-367.000.
Nartowski, Andre , to Regie Nationale des Usines Renault. Control device for the turbine bypass valve of a turbocharged internal combustion engine. 4,466,248, Cl. 60-602.000.
Nasu, Yoshihiro: *See*—
Uehara, Kenichiro; and Nasu, Yoshihiro, 4,467,280, Cl. 324-206.000.
National Can Corporation: *See*—
Zenger, Richard D., 4,466,553, Cl. 220-461.000.
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Hovind, John K., 4,466,225, Cl. 52-730.000.
National Research Institute for Metals: *See*—
Kimura, Katsuyoshi; and Matsumoto, Shojiro, 4,466,270, Cl. 73-1.00R.
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Burns, Carmen D., 4,466,183, Cl. 29-827.000.
Naurath, Rolf H., to Elco International, Ltd. Portable air pump apparatus. 4,466,780, Cl. 417-360.000.
Nayler, Douglas W. J.; Gilson, Gerald W.; Tilker, Fred C.; and Albert, James W., to NL Industries, Inc. Position indicator for drill string compensator. 4,466,488, Cl. 166-355.000.
Naylor, Graham J., to Naylor, Graham John; and Naylor, Pamela Hilda. Bodyweight reducing method. 4,466,978, Cl. 424-280.000.
Naylor, Graham John: *See*—
Naylor, Graham J., 4,466,978, Cl. 424-280.000.
Naylor, Pamela Hilda: *See*—
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Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Verbeek, Francois; Bulten, Eric J.; and Berg, Jan, 4,466,924, Cl. 260-429.00R.
Needham, Martin J., to U.S. Philips Corporation. Thermal imaging apparatus. 4,466,748, Cl. 374-129.000.
Neely, Eric D., to Motorola, Inc. Enable gate for 3 state circuits. 4,467,223, Cl. 307-254.000.
Negishi, Akira: *See*—
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Neiss, Richard W.: *See*—
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Nelson, Carl A. Power drive mechanism for trailer landing gear. 4,466,637, Cl. 280-766.100.
Nelson, Erik K., to Itek Corporation. Half tone screen exposure apparatus. 4,466,735, Cl. 355-71.000.
Nelson, Norvell J., to PSI Star, Inc. Process for etching copper. 4,466,859, Cl. 156-646.000.
Network Control Corporation: *See*—
Stafford, James A.; Neiss, Richard W.; and Coolidge, Daniel S., 4,467,148, Cl. 179-175.30R.
Neumann, Peter, to Sandoz Ltd. Benzoxadiazoles and benzothiadiazoles, their preparation and pharmaceutical compositions containing them. 4,466,972, Cl. 424-266.000.
Neumuller, Walter: *See*—
Hinterreiter, Ignaz; and Neumuller, Walter, 4,466,758, Cl. 405-150.000.
New York City Transit Authority: *See*—
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New York University: *See*—
Nussenzweig, Ruth S.; Godson, G. Nigel; and Nussenzweig, Victor, 4,466,917, Cl. 260-112.00R.
Newman, Seymour: *See*—
Meyer, Fred J.; and Newman, Seymour, 4,467,077, Cl. 524-449.000.
Newport Corporation: *See*—
Thomasson, James T., 4,467,250, Cl. 318-436.000.
NHK Spring Co., Ltd.: *See*—
Ojima, Juji; and Suzuki, Keiichi, 4,466,802, Cl. 474-138.000.
Nichifu Terminal Industries Co., Ltd.: *See*—
Sonoda, Keiji, 4,466,692, Cl. 339-276.0SF.
Nicholas, Paul P.: *See*—
Kroenke, William J.; and Nicholas, Paul P., 4,467,127, Cl. 570-224.000.
Nicoloso, Dante; and Pham Van, Doan, to Alsthom-Atlantique. Pressurized gas circuit breaker including two V-mounted breaker chambers per phase. 4,467,157, Cl. 200-148.00F.
Niida, Taro: *See*—
Tsuruoka, Takashi; Imai, Satoshi; Satoh, Atsuyuki; Watanabe, Tetsuro; Watanabe, Koji; Inouye, Shigeharu; and Niida, Taro, 4,466,913, Cl. 260-112.50R.
Niigata Engineering Co., Ltd.: *See*—
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Nikolson, Robert C.; Vorbruggen, Helmut; Casals-Stenzel, Jorge; and Mannesmann, Gerda, to Schering Aktiengesellschaft. 7-Oxoprostacyclin derivatives and their use as hypotensives and bronchodilators. 4,466,969, Cl. 424-263.000.
Nilsson, Nils A., to Forenade Fabriksverken. Arrangement for a cabinet having a door which can be swung outwards from the cabinet around either of two opposing edges. 4,466,676, Cl. 312-283.000.
Nilsson, Rolf C.: *See*—
Hultman, Bengt G.; and Nilsson, Rolf C., 4,466,861, Cl. 162-38.000.
Nippin Seiko Kabushiki Kaisha: *See*—
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Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
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Nippon Electric Co., Ltd.: *See*—
Akagi, Mikiya; Nishimura, Hiroyuki; and Nishimura, Hideki, 4,467,414, Cl. 364-200.000.
Hayashi, Mineo, 4,467,449, Cl. 365-51.000.
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.
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Matsuda, Akio, 4,467,355, Cl. 358-134.000.
Ogawa, Hiroshi, 4,467,415, Cl. 364-200.000.
Ozawa, Masahide, 4,467,345, Cl. 357-68.000.
Takahashi, Toshiya; and Sato, Yoshikuni, 4,467,447, Cl. 364-900.000.
Tsuruta, Shichiro; and Sakoe, Hiroaki, 4,467,437, Cl. 364-513.500.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Hoso Kyokai: *See*—
Fukushima, Masakazu; Maruyama, Masanori; Ehata, Shigeru; Ogusu, Chihaya; and Isozaki, Yukinao, 4,467,243, Cl. 313-448.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Matsumoto, Mutsumi; and Sugi, Hideki, 4,467,113, Cl. 562-535.000.
Nippon Piston Ring Co., Ltd.: *See*—
Hiraoka, Takeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, 4,467,169, Cl. 219-121.0EB.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,466,405, Cl. 123-416.000.
Yoshino, Yasuhisa; Kodera, Masao; Ito, Hajime; and Ohta, Hisatoshi, 4,467,313, Cl. 340-904.000.
Nippon Steel Corporation: *See*—
Yada, Hiroshi; Matsumura, Yoshikazu; and Nakajima, Koe, 4,466,842, Cl. 148-12.00R.
Nippon Television Network Corp.: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.
Nippondenso Co., Ltd.: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; Takei, Toshihiro; Hayakawa, Hideyuki; and Goshima, Takahiro, 4,466,521, Cl. 192-0.032.
Sakakibara, Shuji; Kondo, Toshio; Kobayashi, Akio; and Isomura, Shigenori, 4,466,410, Cl. 123-440.000.
Yoshimura, Junjiro; Yamada, Kenji; and Obata, Haruyuki, 4,466,414, Cl. 123-564.000.
Nishide, Toshikazu; Kobayashi, Akio; and Kitahata, Tamio, to Konishiroku Photo Industry Co., Ltd. Method for producing a photographic image from a Lippmann type silver halide photographic light-sensitive material. 4,467,029, Cl. 430-441.000.
Nishigaki, Kenichi; Takahashi, Magoichi; and Wakashima, Keiichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Tungsten carbide-base hard alloy for hot-working apparatus members. 4,466,829, Cl. 75-240.000.
Nishihira, Keigo: *See*—
Tahara, Susumu; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Mizutare, Katsuhiko, 4,467,109, Cl. 560-193.000.
Nishii, Michiharu: *See*—
Furuta, Youichi; Tsubouchi, Kaoru; Nishii, Michiharu; Sugiura, Yuzuru; and Tsuchida, Shozaburo, 4,466,246, Cl. 60-547.100.
Nishimoto, Yoshifumi, to Canon Kabushiki Kaisha. Variable-focal-length lens using an electrooptic effect. 4,466,703, Cl. 350-379.000.
Nishimura, Fuminobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic brush apparatus. 4,466,379, Cl. 118-658.000.
Nishimura, Hideki: *See*—
Akagi, Mikiya; Nishimura, Hiroyuki; and Nishimura, Hideki, 4,467,414, Cl. 364-200.000.

Nishimura, Hiroyuki: *See*—
Akagi, Mikiya; Nishimura, Hiroyuki; and Nishimura, Hideki, 4,467,414, Cl. 364-200.000.
Nishioka, Kimihiko: *See*—
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, 4,467,361, Cl. 358-213.000.
Nissan Motor Company, Limited: *See*—
Abe, Masafumi, 4,466,654, Cl. 296-192.000.
Baba, Shigeyuki; and Toda, Tadayoshi, 4,466,655, Cl. 296-214.000.
Handa, Noritoshi, 4,466,568, Cl. 237-12.30C.
Hiraiwa, Kazuyoshi; and Fukuda, Yoshiyuki, 4,466,305, Cl. 74-473.00R.
Kawamura, Yoshihisa, 4,466,416, Cl. 123-571.000.
Mukaeda, Satoshi, 4,466,250, Cl. 60-737.000.
Murase, Isao; and Hirose, Katsutoshi, 4,466,943, Cl. 422-91.000.
Narita, Masanori, 4,466,661, Cl. 297-367.000.
Ogawa, Naoki; and Fujigaya, Kazuyuki, 4,466,401, Cl. 123-195.00H.
Ogawa, Naoki, 4,466,848, Cl. 156-242.000.
Okada, Tadashi; Furukawa, Yuji; and Murata, Makoto, 4,466,635, Cl. 280-661.000.
Takahashi, Kotei, 4,466,300, Cl. 74-12.000.
Takeda, Hitoshi; Suzuki, Hidetaka; Kamijo, Ken; and Nagashima, Hideyuki, 4,467,252, Cl. 318-603.000.
Nissan Motor Company, Limted: *See*—
Kondou, Nobuaki, 4,466,664, Cl. 297-411.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Miyasaka, Koichi, 4,466,671, Cl. 303-6.00C.
Nitro Nobel AB: *See*—
Jelberyd, Leif; and Egerstrom, Gunnar, 4,466,354, Cl. 102-313.000.
Nitsch, Wilhelm; and Nagel, Erich, to Agfa-Gevaert AG. Cassette for rolls of photosensitive material. 4,466,579, Cl. 242-67.10R.
Nitta, Tomio, to Tokai Seiki Co., Ltd. Electronic gas lighter. 4,466,788, Cl. 431-255.000.
Nixon, Jeddy D. Check valve with injector. 4,466,779, Cl. 417-229.000.
NL Industries, Inc.: *See*—
Nayler, Douglas W. J.; Gilson, Gerald W.; Tilker, Fred C.; and Albert, James W., 4,466,488, Cl. 166-355.000.
Nolf, Jean-Marie E.; and Verschelde, Marc, to N.V. Raychem S.A. Method of using heat-recoverable articles to produce a pressurizable casing around a substrate. 4,466,846, Cl. 156-85.000.
Nonoyama, Seiji: *See*—
Kondo, Kouichi; Ueda, Masahiro; and Nonoyama, Seiji, 4,466,625, Cl. 280-6.00R.
Noranda Mines Limited: *See*—
Gauvin, William H.; and Kubanek, George R., 4,466,824, Cl. 75-10.00R.
Nordson Corporation: *See*—
Merkel, Stephen L., 4,467,182, Cl. 219-497.000.
Norman, Robert W. Three vane, two lobe fluid motor. 4,466,783, Cl. 418-15.000.
North Dakota State University Development Foundation: *See*—
Boudjouk, Philip R.; and Han, Byung-Hee, 4,466,870, Cl. 204-158.00S.
Northern Engineering Industries plc: *See*—
Forster, Arthur D.; and Mitchell, James S., 4,466,291, Cl. 73-761.000.
Northern Technologies, Ltd.: *See*—
Dickie, Robert G., 4,467,244, Cl. 315-3.000.
Northern Telecom Limited: *See*—
Arnon, Ephraim; Chomik, Michael W.; and Barlow, Christopher J., 4,467,473, Cl. 370-100.000.
Jakab, Gyula, 4,467,310, Cl. 338-22.00R.
Jenkins, George M., 4,466,381, Cl. 118-728.000.
Notestein, John E.: *See*—
Shang, Jer-Yu; Mei, Joseph S.; Slagle, Frank D.; and Notestein, John E., 4,466,360, Cl. 110-264.000.
Nussenzweig, Ruth S.; Godson, G. Nigel; and Nussenzweig, Victor, to New York University. Malaria vaccine. 4,466,917, Cl. 260-112.00R.
Nussenzweig, Victor: *See*—
Nussenzweig, Ruth S.; Godson, G. Nigel; and Nussenzweig, Victor, 4,466,917, Cl. 260-112.00R.
N.V. Optische Industrie "de Oude Delft": *See*—
Berbee, Hubertus J.; Voute, Hendrik J.; and Thijssen, Johannes M., 4,466,286, Cl. 73-629.000.
N.V. Raychem S.A.: *See*—
Nolf, Jean-Marie E.; and Verschelde, Marc, 4,466,846, Cl. 156-85.000.
O & S Manufacturing Company: *See*—
Smith, Joseph E., 4,466,755, Cl. 403-36.000.
Oba, Takeo: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.
Obara, Hiroshi: *See*—
Nakamura, Kenichi; and Obara, Hiroshi, 4,467,202, Cl. 250-338.000.
Obata, Haruyuki: *See*—
Yoshimura, Junjiro; Yamada, Kenji; and Obata, Haruyuki, 4,466,414, Cl. 123-564.000.
Obernier, Irene C.: *See*—
Calvo, Luis C.; Obernier, Irene C.; and Hasher, Steve J., 4,466,955, Cl. 424-62.000.
Occelli, Mario L.; and Swift, Harold E., to Gulf Research & Development Company. Process for cracking high metals content feedstocks using a cracking catalyst mixture containing antimony and/or tin. 4,466,884, Cl. 208-120.000.
Occidental Chemical Corporation: *See*—
Lin, Henry C.; and Cotter, Byron R., 4,466,927, Cl. 260-544.00C.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,466,668, Cl. 299-2.000.
Ochs, Heinrich: *See*—
Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Neberle, Klaus; Ochs, Heinrich; and Schwebe, Gunter, 4,466,347, Cl. 101-148.000.
O'Connor, Chadwell. Camera lock-plate assembly. 4,466,595, Cl. 248-558.000.
Odenath, Clayton P. Copyholder, lectern, book support. 4,466,593, Cl. 248-455.000.
Oetiker, Hans; and Muller, Roman, to Gebruder Buhler AG. Separating contrivance for cereals. 4,466,542, Cl. 209-44.200.
Ogata, Satoshi; and Fujimoto, Hideyuki, to Optrex Corporation. Highly reliable electrooptical device and process for manufacturing the same. 4,466,701, Cl. 350-336.000.
Ogawa, Hiroshi, to Nippon Electric Co., Ltd. High-speed microprogram control apparatus with decreased control storage requirements. 4,467,415, Cl. 364-200.000.
Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Process for drawing patterns with extremely fine features in the production of VLSI, LSI and IC systems. 4,467,026, Cl. 430-296.000.
Ogawa, Naoki; and Fujigaya, Kazuyuki, to Nissan Motor Company, Limited. Internal combustion engine with bearing beam structure. 4,466,401, Cl. 123-195.00H.
Ogawa, Naoki, to Nissan Motor Company, Limited. Method for making covers. 4,466,848, Cl. 156-242.000.
Ogita, Tadahisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rotary machinery of salient-pole type. 4,467,229, Cl. 310-60.00A.
Oguma, Tomio, to Aisin Seiki Kabushiki Kaisha. System for controlling transmission ratio of transmissicn for automotive vehicles. 4,466,312, Cl. 74-868.000.
Ogura, Takeshi; Tamura, Kimimaro; and Okuma, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Electronic musical instrument. 4,466,326, Cl. 84-1.220.
Ogusu, Chihaya: *See*—
Fukushima, Masakazu; Maruyama, Masanori; Ehata, Shigeru; Ogusu, Chihaya; and Isozaki, Yukinao, 4,467,243, Cl. 313-448.000.
Ohara, Yuji; and Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Half-tone picture recording device. 4,467,367, Cl. 358-298.000.
Ohi Seisakusho Co., Ltd.: *See*—
Kobayashi, Fumio, 4,466,645, Cl. 292-341.120.
Ohmura, Jukichi: *See*—
Hamada, Masato; Ohmura, Jukichi; and Muranaka, Fumio, 4,466,881, Cl. 204-59.00F.
Ohnishi, Masahiro: *See*—
Ohara, Yuji; and Ohnishi, Masahiro, 4,467,367, Cl. 358-298.000.
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, to Olympus Optical Co., Ltd. Image pick-up apparatus. 4,467,361, Cl. 358-213.000.
Ohta, Hisatoshi: *See*—
Yoshino, Yasuhisa; Kodera, Masao; Ito, Hajime; and Ohta, Hisatoshi, 4,467,313, Cl. 340-904.000.
Ohta, Kenji; Deguchi, Toshihisa; and Takahashi, Akira, to Sharp Kabushiki Kaisha. Magnetooptic memory medium. 4,467,383, Cl. 360-131.000.
Ohta, Kouichi: *See*—
Minamida, Kazukiyo; and Ohta, Kouichi, 4,466,499, Cl. 177-1.000.
Ohtsu, Akira: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.
Oishi, Yaichi; Maruyama, Katsuaki; Takano, Kenji; Terada, Takami; and Hyodo, Motoi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aishin Seiki Kabushiki Kaisha. Head-rest for seat of vehicle. 4,466,663, Cl. 297-410.000.
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. EDM controller for providing a rocking motion to the electrode for finish machining. 4,467,167, Cl. 219-69.00C.
Ojima, Juji; and Suzuki, Keiichi, to NHK Spring Co., Ltd. Tension providing mechanism. 4,466,802, Cl. 474-138.000.
Oka, Masahiko; Kano, Hideo; and Ueta, Yutaka, to Daikin Kogyo Company, Limited. Fluoroelastomer composition. 4,467,074, Cl. 525-356.000.
Okabe, Kyoji: *See*—
Kondo, Mikio; and Okabe, Kyoji, 4,466,825, Cl. 75-41.000.
Okabe, Taijiro: *See*—
Tamai, Yasukatsu; Okabe, Taijiro; and Tomita, Akira, 4,466,828, Cl. 75-82.000.
Okada, Tadashi; Furukawa, Yuji; and Murata, Makoto, to Nissan Motor Company, Limited. Vehicle suspension mechanism. 4,466,635, Cl. 280-661.000.
Okada, Takashi, to Sony Corporation. Current mirror circuit. 4,467,289, Cl. 330-288.000.
Okada, Toshio: *See*—
Sakurada, Ichiro; Kaji, Kanako; and Okada, Toshio, 4,466,990, Cl. 427-35.000.

Okamoto, Eisaku; and Mizuno, Kotaro, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performing apparatus of electronic musical instrument. 4,466,324, Cl. 84-1.030.

Okamura, Noriaki: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.

Okapuu, Ulo; and Patel, Kiritkumar V. Circumferentially grooved shroud liner. 4,466,772, Cl. 415-172.00A.

Okinaka, Hideyuki: *See*—
Torii, Hideo; Okinaka, Hideyuki; and Ozawa, Toshio, 4,466,880, Cl. 204-428.000.

Okuma, Yoshikazu: *See*—
Ogura, Takeshi; Tamura, Kimimaro; and Okuma, Yoshikazu, 4,466,326, Cl. 84-1.220.

Okumura, Takeshi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; and Inoue, Tokuta, 4,466,398, Cl. 123-188.00M.

Olah, George A. Condensation of natural gas or methane into gasoline-range hydrocarbons. 4,467,130, Cl. 585-709.000.

Olcott, Donald J. Radioactive source pigtail inspection apparatus and method. 4,467,212, Cl. 250-497.100.

Olin Corporation: *See*—
Gray, Thomas J., 4,466,868, Cl. 204-95.000.

Olivieri, Michael: *See*—
Cuneo, Edward A.; Montei, Harold R.; and Olivieri, Michael, 4,466,184, Cl. 29-830.000.

Olofsson Corporation, The: *See*—
Garnett, Donald W., 4,466,511, Cl. 188-134.000.

Olson, Albert J.: *See*—
Dittakavi, Ashok; and Olson, Albert J., 4,466,801, Cl. 434-335.000.

Olympus Optical Co., Ltd.: *See*—
Baba, Kazuo, 4,466,444, Cl. 128-660.000.
Hashimoto, Akihiko, 4,466,720, Cl. 354-244.000.
Kano, Tokio; and Tamagawa, Akira, 4,466,740, Cl. 356-246.000.
Kato, Toshikazu, 4,467,380, Cl. 360-96.500.
Nakajima, Yukio, 4,466,726, Cl. 354-409.000.
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, 4,467,361, Cl. 358-213.000.
Shibata, Tsutomu, 4,467,462, Cl. 369-45.000.
Utsugi, Mikio, 4,466,443, Cl. 128-660.000.

O'Malley, Austin S.: *See*—
Grant, John L.; Torti, Emanuel D.; O'Malley, Austin S.; Galligan, Thomas W.; and DelPrete, Stephen D., 4,466,684, Cl. 339-176.00M.

OMI International Corporation: *See*—
Tomaszewski, Thaddeus W.; Tremmel, Robert A.; and Rudolph, Larry T., 4,466,865, Cl. 204-51.000.

Omori, Takashi: *See*—
Murayama, Tomio; Moriguchi, Fujio; Kurata, Masami; and Omori, Takashi, 4,467,365, Cl. 358-293.000.

Onder, Kemal: *See*—
Grossman, Steven J.; and Onder, Kemal, 4,467,083, Cl. 528-49.000.

O'Neil, Elbridge A., Jr.: *See*—
Verbicky, John W., Jr.; Cella, James A.; and O'Neil, Elbridge A., Jr., 4,467,097, Cl. 548-461.000.

Oonishi, Akito; and Watanabe, Haruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel cut system for electronic control system. 4,466,413, Cl. 123-493.000.

Ootsuka, Yoshinori: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,466,405, Cl. 123-416.000.

Optimol-Olwerke GmbH: *See*—
Geromiller, Oswald, 4,466,271, Cl. 73-10.000.

Optrex Corporation: *See*—
Ogata, Satoshi; and Fujimoto, Hideyuki, 4,466,701, Cl. 350-336.000.

Orcutt, John W., to Texas Instruments Incorporated. Valve apparatus with improved means to prevent cross-venting. 4,466,460, Cl. 137-625.200.

Oritani, Atsushi, to Fujitsu Limited. Memory circuit. 4,467,456, Cl. 365-190.000.

Orlowski, David C. Sealing rings. 4,466,620, Cl. 277-53.000.

Osawa, Masami, to Kino Precision Industries, Ltd. Zoom lens locking system. 4,466,709, Cl. 350-429.000.

Osgood, Gordon L., Sr. Adjustably positionable locking device for tank caps. 4,466,259, Cl. 70-164.000.

Oshida, Bunzi: *See*—
Imanari, Makoto; Oshida, Bunzi; Arima, Yusaku; Tanaka, Hirokazu; Todo, Yoshinori; Kobayashi, Norihisa; and Sera, Toshikuni, 4,466,947, Cl. 423-239.000.

Osselaere, Guy H. J.; and Danhieux, Daniel M., to Sperry Corporation. Automatic fan speed adjuster for combine harvester. 4,466,230, Cl. 56-10.200.

Osterhout, Ralph F. Divers console with knife and sheath. 4,466,283, Cl. 73-300.000.

Ostermann, Albrecht: *See*—
Faas, Harald; Lenzen, Ditrich; Weik, Hans; Ostermann, Albrecht; and Reimann, Wolfgang, 4,466,817, Cl. 55-455.000.

Osypka, Peter. Connector for the conductors of implanted medical devices. 4,466,690, Cl. 339-272.00A.

Ota, Yoshihiro; and Kobayashi, Mitsuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Selectively lockable push switch. 4,467,159, Cl. 200-153.00J.

Ottman, John C.; and Shen, John C. S., to International Business Machines Corporation. Fixed abrasive polishing media. 4,466,218, Cl. 51-395.000.

Otto, Charles W., to General Electric Company. Method of forming a bearing. 4,466,165, Cl. 29-149.5PM.

Outboard Marine Corporation: *See*—
McChesney, Richard M.; and DuBois, Chester G., 4,466,412, Cl. 123-492.000.

OV-Eng Oy: *See*—
Vartiainen, Osmo, 4,466,826, Cl. 75-63.000.

Overby, Victor: *See*—
Clark, Douglas; and Overby, Victor, 4,466,715, Cl. 353-45.000.

Owen, Thomas E.; Darilek, Glenn T.; Peters, Wendell R.; and Bryan, Edward L., to Geo-Optics, Ltd. Electrical geophysical exploration system with addressable current probes. 4,467,283, Cl. 324-363.000.

Owens-Corning Fiberglas Corporation: *See*—
Dunn, Michael P., 4,466,819, Cl. 65-4.400.

Owens-Illinois, Inc.: *See*—
Hines, William A., 4,467,241, Cl. 313-402.000.
Irwin, George W.; and Mumford, Eustace H., 4,466,821, Cl. 65-307.000.
Miller, John W. V., 4,467,350, Cl. 358-106.000.

Oy Safematic Ltd.: *See*—
Huhtala, Teuvo T., 4,466,293, Cl. 73-861.540.

Ozaki, Yasuo: *See*—
Kobayashi, Akio; Ozaki, Yasuo; and Rikitake, Sunao, 4,467,158, Cl. 200-148.00A.

Ozawa, Masahide, to Nippon Electric Co., Ltd. Semiconductor integrated circuit device. 4,467,345, Cl. 357-68.000.

Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, to Hitachi, Ltd. Color imaging device. 4,467,347, Cl. 358-44.000.

Ozawa, Shoji, to Tomy Kogyo Co., Inc. Extendable hand amusement device. 4,466,649, Cl. 294-19.00R.

Ozawa, Toshio: *See*—
Torii, Hideo; Okinaka, Hideyuki; and Ozawa, Toshio, 4,466,880, Cl. 204-428.000.

Paakki, Matti, to Raute Oy. Equipment for the manufacture of a continuous multi-layer veneer board. 4,466,856, Cl. 156-558.000.

Package Machinery Company: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,466,500, Cl. 177-1.000.

Padalka, Valentin G.: *See*—
Andreev, Anatoly A.; Gavrilov, Alexei G.; Galitskaya, Galina K.; Zhed, Viktor P.; Sinelschikov, Andrei K.; Padalka, Valentin G.; and Tolok, Vladimir T., 4,466,991, Cl. 427-38.000.

Page, Kenneth, to Lucas Industries public limited company. Starting aids for internal combustion engines. 4,466,391, Cl. 123-145.00A.

Page, Ronald. Power switching apparatus. 4,467,220, Cl. 307-19.000.

Palacio, Joaquin J.; and Cristobal, Carlos C., to Gang-Nail Systems, Inc. Insulation support clip. 4,466,223, Cl. 52-404.000.

Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, to Safta S.p.A.; and Bieffe S.P.A. Valves for sterilizable flat flexible containers and process for their manufacture. 4,467,003, Cl. 428-64.000.

Palm, William J.: *See*—
Datseris, Philip S.; Sayder, Ali C.; and Palm, William J., 4,466,768, Cl. 414-729.000.

Pamer, Steven E., to PPG Industries, Inc. Unsaturated 1,3-dioxolane stabilized with aliphatic aldehyde hydrazone. 4,466,903, Cl. 252-392.000.

Panametrics, Inc.: *See*—
Rappaport, Andrew S., 4,467,203, Cl. 250-343.000.

Pandrol Limited: *See*—
Taylor, Howard P. J., 4,466,569, Cl. 238-1.000.

Panetta, Domenico, to Unifilter di D. Panetta. Antitheft device for trailers and semitrailers. 4,466,260, Cl. 70-181.000.

Panigati, Pier L., to Etablissement d'Oocident. Sealing arrangement. 4,466,624, Cl. 277-171.000.

Paranjpe, Suresh C.: *See*—
Bobick, Thomas W.; Clark, Frederic L.; and Paranjpe, Suresh C., 4,467,366, Cl. 358-296.000.

Pariani, Emilio, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Countertorque rotor for helicopters. 4,466,773, Cl. 416-134.00A.

Park, Dong K.: *See*—
Kim, Young G.; and Park, Dong K., 4,466,939, Cl. 420-485.000.

Parker-Hannifin Corporation: *See*—
Sharp, Bernard C., 4,466,594, Cl. 248-484.000.

Parker Manufacturing Company: *See*—
Thomson, Morton W., 4,466,471, Cl. 145-33.00A.

Parker, Thomas S.: *See*—
Mueller, Mark W.; Parker, Thomas S.; Benignus, Douglas M.; and Frye, James L., 4,467,445, Cl. 364-900.000.

Parks, Anthony J.; and Lindsay, Richard A., to W. Vinten Limited. Lightweight tilt mounting heads. 4,466,590, Cl. 248-185.000.

Pasquini, Sandro, to Sig Societe Industrielle Suisse. Railway track tamping machine. 4,466,355, Cl. 104-12.000.

Pastor, Angle A. Active physiotherapeutic device. 4,466,611, Cl. 272-96.000.

Patel, Kiritkumar V.: *See*—
Okapuu, Ulo; and Patel, Kiritkumar V., 4,466,772, Cl. 415-172.00A.

Patel, Pinakin; Dharia, Dilip; and Maru, Hansraj, to Energy Research Corporation. Fuel cell catalyst member and method of making same. 4,467,050, Cl. 502-330.000.

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Rakitsch, Peter, 4,467,239, Cl. 313-113.000.

Patsch, Manfred: *See*—
Ditter, Walter; Etzbach, Karl-Heinz; Horn, Dieter; Patsch, Manfred; and Eilingsfeld, Heinz, 4,466,899, Cl. 252-299.100.

Pauly, John A.; and Cenedella, Richard W., to Baxter Travenol Laboratories, Inc. Temperature sensing system for microwave oven apparatus. 4,467,163, Cl. 219-10.55F.

Pavelin, Dennis F.: *See*—
Johnston, Roy G. S.; and Pavelin, Dennis F., 4,466,937, Cl. 264-256.000.

Pearson, Bernard A.: *See*—
Snellman, Donald L.; and Pearson, Bernard A., 4,466,606, Cl. 271-221.000.

Pease, Robert E.: *See*—
Poulsen, Peter D.; Stein, Richard J.; and Pease, Robert E., 4,466,667, Cl. 299-1.000.

Pedersen, Lee C.; and Elmquist, Lyle F., to Grain Processing Corporation. Composition for absorbent film and method of preparation. 4,467,012, Cl. 428-248.000.

Peffer, John R.: *See*—
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,467,081, Cl. 528-26.000.

Pefley, Richard K.; and Pullman, J. Barrett, to Prodatek Corporation. Refrigerated filter assembly and method of using same. 4,466,257, Cl. 62-318.000.

Pelletier, Robert: *See*—
Brun, Claude; and Pelletier, Robert, 4,467,080, Cl. 526-62.000.

Pels, Susan J., to Xerox Corporation. Higher productivity recirculative document copying. 4,466,733, Cl. 355-14.00R.

Perlstein, Abraham: *See*—
Grynberg, Ami; Perlstein, Abraham; and Gliksman, Edward, 4,466,288, Cl. 73-654.000.

Peroutky, Donald C., to General Electric Company. Robotic machine. 4,466,770, Cl. 414-751.000.

Perozzi, Edmund F.: *See*—
Rajan, Sundar J.; and Perozzi, Edmund F., 4,467,106, Cl. 560-72.000.

Perraudin, Rolland: *See*—
Bruni, Maurice; Delode, Georges; and Perraudin, Rolland, 4,467,040, Cl. 501-80.000.
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Perry, Charles B.: *See*—
Davis, Thomas J.; and Perry, Charles B., 4,467,281, Cl. 324-232.000.

Perry, Jack I.: *See*—
Minneman, Lester C.; and Perry, Jack I., 4,466,532, Cl. 198-490.000.

Perry, John C. Lubrication means for a two-cycle internal combustion engine. 4,466,387, Cl. 123-41.370.

Person, Herman R.; and Johnson, Douglas E., to Dale Electronics, Inc. Electrical resistor. 4,467,311, Cl. 338-293.000.

Peters, Wendell R.: *See*—
Owen, Thomas E.; Darilek, Glenn T.; Peters, Wendell R.; and Bryan, Edward L., 4,467,283, Cl. 324-363.000.

Peterson, Michael: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,466,675, Cl. 312-263.000.

Petroski, Peter J.: *See*—
Batey, Robert M.; and Petroski, Peter J., 4,467,374, Cl. 360-46.000.

Petrovich, Vojislav. Froth flotation method for recovering minerals. 4,466,886, Cl. 209-166.000.

Pezelet, Jackie: *See*—
Boichot-Castagne, Bernard; Case, Roger; and Pezelet, Jackie, 4,467,297, Cl. 335-8.000.

Pfeiffer, Heinrich, to Maschinenfabrik J. Dieffenbacher GmbH & Co. Continuously operating press for the production of particle board, fiberboard, plywood sheets or the like. 4,466,857, Cl. 156-583.500.

Pfeiffer, Peter: *See*—
Bauer, Karlheinz; Langenbeck, Andreas; Pfeiffer, Peter; and Tomforde, Johann, 4,467,402, Cl. 362-32.000.

Pfenninger, Heinz: *See*—
Horlacher, Paul; and Pfenninger, Heinz, 4,466,900, Cl. 252-301.230.

Pfister GmbH: *See*—
Hafner, Hans W., 4,466,297, Cl. 73-862.640.

Pfizer Inc.: *See*—
Massett, Stephen S.; and Watson, Harry A., Jr., 4,467,090, Cl. 546-85.000.
Miller, James W.; and Tate, Bryce E., 4,466,889, Cl. 252-8.55D.
Richardson, Kenneth; and Cooper, Kelvin, 4,466,974, Cl. 424-269.000.

Pham Van, Doan: *See*—
Nicoloso, Dante; and Pham Van, Doan, 4,467,157, Cl. 200-148.00F.

Phillips Petroleum Company: *See*—
Dreiling, Mark J., 4,466,992, Cl. 427-39.000.
Scott, Richard L., 4,467,038, Cl. 436-115.000.
Washer, Stone P.; and Van Pool, Joe, 4,467,131, Cl. 585-723.000.

Phillips, Walter J.; and Rawlings, Herbert L., to Mobay Chemical Corporation. Conductive thermoplastic compositions. 4,466,912, Cl. 252-512.000.

Physical Systems, Inc.: *See*—
Hutter, Charles G., III, 4,466,764, Cl. 414-121.000.

Piaget, Bernard; and Piquard, Jean-Francois, to Commissariat a l'Energie Atomique. Multielement ultrasonic probe and its production process. 4,467,237, Cl. 310-334.000.

Pierdet, Andre : *See*—
Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , 4,466,971, Cl. 424-266.000.

Piesche, Gunter, to Ranco Incorporated. EGR Control systems for diesel engines. 4,466,415, Cl. 123-569.000.

Piezo Electric Products, Inc.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 4,467,236, Cl. 310-321.000.

Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. Esters of 2-(2-chlorocarbonyl)-2-(2,3-dihydro-2-alkylbenzofuran-7-yl)-hydrazinecarboxylic acid. 4,467,104, Cl. 549-462.000.

Pillette, Kibbie P. Leak detection system. 4,466,273, Cl. 73-46.000.

Pioneer Electronic Corporation: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,467,377, Cl. 360-96.100.
Sato, Takashi, 4,467,375, Cl. 360-72.100.

Piquard, Jean-Francois: *See*—
Piaget, Bernard; and Piquard, Jean-Francois, 4,467,237, Cl. 310-334.000.

Piritore, Giuseppe: *See*—
Cornacchia, Felice; and Piritore, Giuseppe, 4,466,636, Cl. 280-724.000.

Pittman, Ray C., to University of California. Intracellular trapping of therapeutics or tracer agents. 4,466,951, Cl. 424-1.100.

Pittway Corporation: *See*—
Conforti, Frederick J.; and Fenne, Kenneth R., 4,467,263, Cl. 320-2.000.

Plasti-Pak: *See*—
Barnwell, Robert; and Frye, David R., 4,467,052, Cl. 521-92.000.

Plastiques Industriels Thecla: *See*—
Lotrous, Robert; and Darbois, Paul, 4,466,540, Cl. 206-387.000.

Plischka, Gerhard, to Dendia-Werk Dr. Ing. Hans O. Scheid Gesellschaft M.B.H. Helicoidally grooved dental burr. 4,466,795, Cl. 433-166.000.

Pneumo Corporation: *See*—
Vanderlaan, Robert D., 4,466,597, Cl. 251-130.000.

Pniewski, Gary A.: *See*—
Dvorak, Edwin A.; Nagy, George, Jr.; Puscasu, Boris; and Pniewski, Gary A., 4,467,156, Cl. 200-84.00R.

Pogharian, Mardig V.; and Pogharian, Vahan M. Jewelry clasp. 4,466,162, Cl. 24-585.000.

Pogharian, Vahan M.: *See*—
Pogharian, Mardig V.; and Pogharian, Vahan M., 4,466,162, Cl. 24-585.000.

Poitier, Gerard C. M., to Societe Anonyme des Usines Chausson. Device for mutual assembly of two parts having to be occasionally disassembled. 4,466,754, Cl. 403-11.000.

Polach, Wilhelm: *See*—
Babitzka, Rudolf; Polach, Wilhelm; and Schlagmuller, Walter, 4,466,390, Cl. 123-90.160.

Polaroid Corporation: *See*—
Alston, Lawrence E., 4,467,369, Cl. 358-332.000.
Bruder, Alan H., 4,466,470, Cl. 141-1.100.
Schuler, Norman W.; and Scupp, Gary T., 4,466,704, Cl. 350-398.000.

Polcer, John: *See*—
Wilson, John E.; and Polcer, John, 4,466,481, Cl. 165-70.000.

Poler, Stanley, to Lynell Medical Technology Inc. Intraocular and extraocular lens construction and method of making the same. 4,466,858, Cl. 156-643.000.

Polley, Richard B.: *See*—
Messersmith, Robert C.; and Polley, Richard B., 4,466,356, Cl. 105-358.000.

Polychrome Corporation: *See*—
Huang, Jen-chi; and Shelnut, James, 4,467,028, Cl. 430-302.000.

Polymotor Italiana S.p.A.: *See*—
Biglino, Renato, 4,467,231, Cl. 310-154.000.

Poong San Metal Corporation: *See*—
Kim, Young G.; and Park, Dong K., 4,466,939, Cl. 420-485.000.

Porta Systems Corp.: *See*—
Singer, Loren A., Jr., 4,466,688, Cl. 339-252.00R.

Portaphone AG: *See*—
Resch, Heinz; Machl, Franz; Kerschbaumer, Klaus; and Ullrich, Helmut, 4,467,141, Cl. 179-2.0EA.

Potash, Hanan; Levin, Burton L.; and Genter, Melvyn E., to Burroughs Corporation. Flexible computer architecture using arrays of standardized microprocessors customized for pipeline and parallel operations. 4,467,409, Cl. 364-200.000.

Poulsen, Peter D.; Stein, Richard J.; and Pease, Robert E., to United States of America, National Aeronautics and Space Administration. Longwall shearer tracking system. 4,466,667, Cl. 299-1.000.

Powell, Brian D.: *See*—
Jones, David B.; and Powell, Brian D., 4,466,145, Cl. 5-82.00R.

PPG Industries, Inc.: *See*—
Barch, Herbert W.; Martin, Emil; and Greer, S. Thomas, 4,466,151, Cl. 15-209.00D.
Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,467,081, Cl. 528-26.000.
DeTorre, Robert P., 4,466,562, Cl. 225-2.000.
Gillery, F. Howard, 4,466,875, Cl. 204-192.00R.
Pamer, Steven E., 4,466,903, Cl. 252-392.000.

Prabhu, Ashok N.; and Hang, Kenneth W., to RCA Corporation. Indium oxide resistor inks. 4,467,009, Cl. 428-210.000.

Prade, Ernstfried; and Fichtner, Hans, to Mistral Windsurfing A.G. Footloops on surfboards. 4,466,373, Cl. 114-39.000.

Premier Pneumatics, Inc.: *See*—
Feldsted, Robert J. C., 4,466,760, Cl. 406-41.000.

Prener, Jerome S.: *See*—
Silverstein, Seth D.; and Prener, Jerome S., 4,467,238, Cl. 313-25.000.

Prescott, Roger, to Great Lakes Carbon Corporation. Method of maintaining and repairing protective coatings for the high temperature zones of engines. 4,466,997, Cl. 427-140.000.

Price, Elvin C.; Young, James R.; and Bottoms, Joseph A., to Atlanta Attachment Company. Intermittent top shirring attachment for sewing machine. 4,466,367, Cl. 112-134.000.

Pries, Robert W.: *See*—
Champion, James R.; and Pries, Robert W., 4,466,731, Cl. 355-14.00D.

Prince Corporation: *See*—
Alofs, Wayne J., 4,466,477, Cl. 164-150.000.

Prodatek Corporation: *See*—
Pefley, Richard K.; and Pullman, J. Barrett, 4,466,257, Cl. 62-318.000.

Pruett, Michael D.: *See*—
Thiel, Peter H.; Mercier, George E.; and Pruett, Michael D., 4,467,397, Cl. 361-328.000.

PSI Star, Inc.: *See*—
Nelson, Norvell J., 4,466,859, Cl. 156-646.000.

Puff, Norbert M. Electronic audio-visual timepiece. 4,466,743, Cl. 368-63.000.

Puglisi, Vincent J., to Yardngy Corporation. Rechargeable lead-hydrogen electrochemical cell. 4,467,020, Cl. 429-101.000.

Pullman, J. Barrett: *See*—
Pefley, Richard K.; and Pullman, J. Barrett, 4,466,257, Cl. 62-318.000.

Purnell, Arthur W.: *See*—
Zerlaut, Gene A.; Whitaker, Richard D.; and Purnell, Arthur W., 4,467,438, Cl. 364-525.000.

Puscasu, Boris: *See*—
Dvorak, Edwin A.; Nagy, George, Jr.; Puscasu, Boris; and Pniewski, Gary A., 4,467,156, Cl. 200-84.00R.

Pusch, Gunter; Weimar, Reinhold; and Aisslinger, Dieter E. IR-Reflecting, water vapor-permeable flexible web. 4,467,005, Cl. 428-111.000.

Puskas, Imre; and James, David E., to Standard Oil Company (Indiana). Process for purification of crude terephthalic acid. 4,467,110, Cl. 562-487.000.

Puskas, Imre; and James, David E., to Standard Oil Company (Indiana). Process for purification of crude terephthalic acid. 4,467,111, Cl. 562-487.000.

Pustell, Robert A., to General Electric Company. Thermocouple with out-of-line aspiration holes. 4,467,134, Cl. 136-231.000.

Quinquis, Jean-Paul. Data transmission system resolving access conflicts between transmitters-receivers to a common bus. 4,467,418, Cl. 364-200.000.

Racki, Daniel J.: *See*—
Kasner, William H.; Racki, Daniel J.; and Swenson, Clark E., 4,466,739, Cl. 356-138.000.

Radant Systems, Inc.: *See*—
Vidal, Paul F.; and Goodrich, Fred N. S., 4,467,330, Cl. 343-872.000.

Rademakers, Petrus J., to Datawell B.V. Buoy for measuring wave slopes. 4,466,281, Cl. 73-170.00A.

Rafael, Aruth: *See*—
Maurer, Erich; Rafael, Aruth; and Wefing, Heinrich, 4,466,384, Cl. 122-392.000.

Ragir, Meyer J.; and Bielecki, John M., to Ragir, Meyer J. Apparatus for forming support device. 4,466,787, Cl. 425-122.000.

Raines, James G. Holding fixture for drilling oblique holes. 4,466,601, Cl. 269-79.000.

Rajan, Sundar J.; and Perozzi, Edmund F., to Ethyl Corporation. Polyether/polyester glycol process. 4,467,106, Cl. 560-72.000.

Rakitsch, Peter, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Structural unit comprising a reflector and a halogen cycle incandescent lamp of low wattage. 4,467,239, Cl. 313-113.000.

Ramer, Jon, to United States of America, Army. Microwave quarter-square multiplier. 4,467,442, Cl. 364-843.000.

Rammler, Roland; and Bussmann, Alfons, to Metallgesellschaft Aktiengesellschaft. Equipment for devolatilizing devolatilizable fine-grained material by means of hot fine-grained heat-carrying material. 4,466,863, Cl. 202-99.000.

Ramos, Terry J., to United States of America, Energy. Laser cutting nozzle. 4,467,171, Cl. 219-121.0LG.

Ranco Incorporated: *See*—
Piesche, Gunter, 4,466,415, Cl. 123-569.000.

Ranks Hovis McDougall Limited: *See*—
Towersey, Peter J.; Longton, John; and Cockram, Geoffrey N., 4,466,988, Cl. 426-656.000.

Rappaport, Andrew S., to Panametrics, Inc. Low noise amplifier and method for energy biased radiation sensitive receiver. 4,467,203, Cl. 250-343.000.

Rasclard, Michel: *See*—
Finaz, Gilles; Michon, Robert; and Rasclard, Michel, 4,467,051, Cl. 521-77.000.

Raskai, Magda: *See*—
Szijjarto nee Auber, Emilia; and Raskai, Magda, 4,466,961, Cl. 424-180.000.

Rasmussen, Chris R., to McNeilab, Inc. N-aryl-N'-(1,4,5,6-tetrahydropyrimidin-2-yl)ureas for intestinal disorders. 4,466,966, Cl. 424-251.000.

Rathmann, Klaus, to VDO Adolf Schindling AG. Device for the unlocking and locking of doors. 4,466,263, Cl. 70-264.000.

Ratkowski, Stephen G.: *See*—
Ruyak, Robert F.; Ratkowski, Stephen G.; Ciprich, Samuel D.; and Silver, Theodore R., 4,466,276, Cl. 73-59.000.

Rau, Karlheinz: *See*—
Christiansen, Uwe; Rau, Karlheinz; and Simmat, Fritz, 4,466,700, Cl. 350-310.000.

Raucourt, Dominique: *See*—
Even, Andre; Fortier, Christian; Guillard, Michel G.; Hedoin, Dominique; Le Guen, Serge; and Raucourt, Dominique, 4,467,430, Cl. 364-436.000.

Raudys, Vytas A., to Union Carbide Corporation. Overwrapped disks in a package article for automatically and continuously making sausages with flat ends. 4,466,466, Cl. 138-118.100.

Raudys, Vytas A.: *See*—
Kupcikevicius, Vytautas; and Raudys, Vytas A., 4,466,464, Cl. 138-118.100.

Rausch, Maurice K.: *See*—
Eickemeyer, Daniel B.; Rausch, Maurice K.; and Tollefsen, Gerald E., 4,466,883, Cl. 208-50.000.

Raute Oy: *See*—
Paakki, Matti, 4,466,856, Cl. 156-558.000.

Rawlin, Vincent K.: *See*—
Sovey, James S.; Rawlin, Vincent K.; and Roman, Robert F., 4,466,242, Cl. 60-202.000.

Rawlings, Herbert L.: *See*—
Phillips, Walter J.; and Rawlings, Herbert L., 4,466,912, Cl. 252-512.000.

Ray, Dalph D. Training device for bicyclists. 4,466,797, Cl. 434-61.000.

Ray, Michael D.: *See*—
Rudolph, Dale C.; and Ray, Michael D., 4,467,273, Cl. 324-65.00R.

Raychem Corporation: *See*—
Shimirak, Gerald L., 4,466,843, Cl. 156-48.000.

Raychem Limited: *See*—
Crofts, David, 4,467,002, Cl. 428-36.000.
Jonathan, Paget; and Thomas, David H., 4,467,137, Cl. 174-87.000.

Raytheon Company: *See*—
Chambers, Derek; and Wang, Dee, 4,467,268, Cl. 323-222.000.

RCA Corporation: *See*—
Hughes, Larry M., 4,467,466, Cl. 369-77.200.
Maddox, William J., 4,467,224, Cl. 307-270.000.
Prabhu, Ashok N.; and Hang, Kenneth W., 4,467,009, Cl. 428-210.000.
Tower, John R., 4,467,342, Cl. 357-30.000.
Wasson, Richard A., 4,467,386, Cl. 361-106.000.
Wilbur, Leonard P., Jr.; and Wardell, Myron H., Jr., 4,467,242, Cl. 313-406.000.
Yarnitsky, Yashaya; and Livny, Avinoam, 4,466,555, Cl. 221-224.000.

Readhead, John B.: *See*—
Blackburn, Anthony; and Readhead, John B., 4,467,201, Cl. 250-334.000.

Recognition Equipment Incorporated: *See*—
Eby, John C., Jr.; Cauthron, David L.; Ludeman, Michael M.; and Hicks, James R., 4,467,354, Cl. 358-133.000.

Red Dot Corporation: *See*—
Hansen, Gary P., 4,466,456, Cl. 137-596.200.

Redden Net Co., Inc.: *See*—
Matheson, Mackenzie W., 4,466,331, Cl. 87-12.000.

Redfern, David J.: *See*—
Rogers, John; and Redfern, David J., 4,466,378, Cl. 118-411.000.

Reed Rock Bit Company: *See*—
Deane, John D.; and Kotch, Robert J., 4,466,622, Cl. 277-92.000.

Reeh, Holger; and Geiss, Josef, to Mathilde Reeh. Adjustment assembly for the rotary torchhead of an electrical welding gun. 4,467,175, Cl. 219-137.310.

Rees, James D., to Xerox Corporation. Compact full frame illumination and imaging system for a photocopier. 4,466,734, Cl. 355-58.000.

Reese, John W., to Biokinetics, Inc. Portable quadriceps exerciser. 4,466,613, Cl. 272-142.000.

Refoy, Brian G.; and Taylor, Earnest E. Monitor for an electrically-controlled system. 4,467,391, Cl. 361-179.000.

Regan, Patricia G. Portable baby changer. 4,466,146, Cl. 5-98.00B.

Regehr, John L.; and Sendelbach, Lee A., to International Business Machines Corporation. Image rotate control circuitry. 4,467,448, Cl. 364-900.000.

Regie Nationale des Usines Renault: *See*—
Nartowski, Andre , 4,466,248, Cl. 60-602.000.

Reid, Dennis. Variable time delay apparatus for controlling the start of a vehicle. 4,467,219, Cl. 307-10.00R.

Reimann, Wolfgang: *See*—
Faas, Harald; Lenzen, Ditrich; Weik, Hans; Ostermann, Albrecht; and Reimann, Wolfgang, 4,466,817, Cl. 55-455.000.

Reinmuth, Klaus: *See*—
Kriegesmann, Jochen; Lipp, Alfred; and Reinmuth, Klaus, 4,467,043, Cl. 501-88.000.

Reisem, Daniel E., to Minnesota Mining and Manfacturing Company. Saturable tandem coil transformer relay. 4,467,304, Cl. 335-227.000.

Rellick, Joseph R., to Du Pont de Nemours, E. I., and Company. Thick film gold metallization composition. 4,466,830, Cl. 106-1.180.

Remund, Ulrich: *See*—
Zwahlen, Hermann; and Remund, Ulrich, 4,466,543, Cl. 209-556.000.

Remus, Casimer F., to Bendix Corporation, Flight Sys. Div., The. Self-adjusting bias for synchro system. 4,466,278, Cl. 73-115.000.

Remus, Hans-Jurgen: *See*—
Antognini, Luciano; and Remus, Hans-Jurgen, 4,467,256, Cl. 318-696.000.

Rengo Co., Ltd.: *See*—
Tokuno, Masateru; and Sawada, Tetsuya, 4,466,320, Cl. 83-325.000.

Rennie, Thomas. Method of treating nasal and sinus congestion. 4,466,973, Cl. 424-267.000.
Repplinger, Wilhelm; Hubschen, Gerhard; and Salzburger, Hans-Jurgen J., to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Non-destructive, non-contact ultrasonic material. 4,466,287, Cl. 73-643.000.
Resch, Heinz; Machl, Franz; Kerschbaumer, Klaus; and Ullrich, Helmut, to Portaphone AG. Telecommunication system with radio line. 4,467,141, Cl. 179-2.0EA.
Research Instituut Sesto B.V.: *See*—
Godijn, Willem, 4,466,790, Cl. 431-337.000.
Rhoades, Terence J.: *See*—
Bennington, James E.; Boerma, Michael J.; Brakora, Anthony J.; Locker, Donald H.; and Rhoades, Terence J., 4,466,294, Cl. 73-862.130.
Rhodes, Harold A.: *See*—
Dille, Roger M.; Richter, George N.; Estabrook, Lawrence E.; Rohner, Jean-Georges P.; and Rhodes, Harold A., 4,466,810, Cl. 48-197.00R.
Rhodes, Kenneth E., to International Business Machines Corporation. OR Product term function in the search array of a PLA. 4,467,439, Cl. 364-716.000.
Rhone-Poulenc Chimie de Base: *See*—
Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,467,055, Cl. 523-200.000.
Rhone-Poulenc Sante: *See*—
Bizot, Jean; and Deprez, Dominique, 4,466,866, Cl. 204-78.000.
Riccar Co., Ltd.: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Doi, Keiichiro; and Tanaka, Seiji, 4,467,162, Cl. 219-10.49R.
Rice, George W., to Conoco Inc. Interactive color analysis of geophysical data. 4,467,461, Cl. 367-70.000.
Rich, Robert L. Nonslip fastener torquing system. 4,466,314, Cl. 81-90.00C.
Richardson, Kenneth; and Cooper, Kelvin, to Pfizer Inc. Bistriazole antifungal agents. 4,466,974, Cl. 424-269.000.
Richter, George N.: *See*—
Dille, Roger M.; Richter, George N.; Estabrook, Lawrence E.; Rohner, Jean-Georges P.; and Rhodes, Harold A., 4,466,810, Cl. 48-197.00R.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method of forming an in situ oil shale retort in formation with joints. 4,466,668, Cl. 299-2.000.
Ricoh Company, Ltd.: *See*—
Akutsu, Eiichi, 4,467,332, Cl. 346-140.00R.
Asami, Shinichi; Sakamoto, Hiroshi; and Inaba, Norihiko, 4,467,339, Cl. 346-214.000.
Ishima, Kazumi, 4,467,183, Cl. 219-497.000.
Kurisu, Norio; Matsuda, Tsutomu; Watanabe, Hideo; and Watanabe, Nobuyoshi, 4,467,024, Cl. 430-166.000.
Richl, Fred, to Robertshaw Controls Company. Igniter/flame sensor assembly for gas burner. 4,466,789, Cl. 431-264.000.
Rife, Dwight A.: *See*—
Garner, Lloyd L.; Westfall, Samuel R.; and Rife, Dwight A., 4,466,621, Cl. 277-84.000.
Rikitake, Sunao: *See*—
Kobayashi, Akio; Ozaki, Yasuo; and Rikitake, Sunao, 4,467,158, Cl. 200-148.00A.
Rinaldi, Gerald M., to GTE Automatic Electric Labs Inc. Pulse monitor circuit. 4,467,285, Cl. 328-112.000.
Ring, Michael; and Angelini, Peter, to International Paper Company. Method for screening, separating, and removing fiber bundles, lumps, knots and foreign matter from aqueous dispersions used in forming non-woven fabrics by wet-laying. 4,466,862, Cl. 162-55.000.
Ringwald, Peter: *See*—
Kemmner, Ulrich; and Ringwald, Peter, 4,466,781, Cl. 417-366.000.
Rissanen, Jorma J.: *See*—
Langdon, Glen G., Jr.; and Rissanen, Jorma J., 4,467,317, Cl. 340-347.0DD.
Ritchie, John A., to McGraw-Edison Company. Battery overcharge protection system. 4,467,266, Cl. 320-40.000.
Ritter, David, to Temporal Dynamics Research, Inc. Sound reproducing combination. 4,466,505, Cl. 181-144.000.
Ritter, Gerhard: *See*—
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,466,304, Cl. 74-346.000.
Ritter, Josef: *See*—
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,466,304, Cl. 74-346.000.
Ritter, Klaus: *See*—
Gott, Hans; Ritter, Josef; Ritter, Gerhard; and Ritter, Klaus, 4,466,304, Cl. 74-346.000.
Riv-SKF Officine Di Villar Perosa S.p.A.: *See*—
Milazzo, Giuseppe, 4,466,292, Cl. 73-789.000.
RM Industries, Inc.: *See*—
Montiero, Richard, 4,466,185, Cl. 30-103.000.
Robbins, David L., to Minnesota Mining and Manufacturing Company. Overpressure relief system. 4,466,433, Cl. 128-202.220.
Robert Bosch GmbH: *See*—
Aures, Reinhard; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,466,407, Cl. 123-425.000.
Babitzka, Rudolf; Polach, Wilhelm; and Schlagmuller, Walter, 4,466,390, Cl. 123-90.160.
Hartung, Erwin; Klenk, Martin; and Moller, Heinz, 4,466,406, Cl. 123-425.000.
Hassler, Albin; and Friz, Eckehart, 4,467,272, Cl. 324-59.000.
Horstmann, Winfried, 4,467,368, Cl. 358-310.000.
Kemmner, Ulrich; and Ringwald, Peter, 4,466,781, Cl. 417-366.000.
Leiber, Heinz, 4,466,458, Cl. 137-606.000.
Seibicke, Horst, 4,466,153, Cl. 15-250.160.
Robertshaw Controls Company: *See*—
Riehl, Fred, 4,466,789, Cl. 431-264.000.
Rock Bit Industries U.S.A., Inc.: *See*—
Garner, Lloyd L.; Westfall, Samuel R.; and Rife, Dwight A., 4,466,621, Cl. 277-84.000.
Rockwell International Corporation: *See*—
Apel, Thomas R., 4,467,293, Cl. 333-112.000.
Clarke, David R., 4,466,820, Cl. 65-30.140.
De Wames, Roger E.; and Staples, Edward J., 4,467,235, Cl. 310-313.00D.
Rode, Jonathan P.; and Chow, Kuen, 4,467,340, Cl. 357-24.000.
Soclof, Sidney I., 4,466,178, Cl. 29-576.00B.
Soclof, Sidney I., 4,466,180, Cl. 29-580.000.
Rode, Jonathan P.; and Chow, Kuen, to Rockwell International Corporation. Pre-multiplexed Schottky barrier focal plane. 4,467,340, Cl. 357-24.000.
Roedel, Mark F. Golf ball and tee handling tool. 4,466,650, Cl. 294-19.00A.
Rogers, John; and Redfern, David J., to Dynamelt Limited. Coating applicator head. 4,466,378, Cl. 118-411.000.
Rogers, Lockhart B., to Du Pont de Nemours, E. I., and Company. Gaseous contaminant dosimeter. 4,466,942, Cl. 422-61.000.
Rohde, Siegfried: *See*—
Aures, Reinhard; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,466,407, Cl. 123-425.000.
Rohm and Haas Company: *See*—
Smolanoff, Joel R., 4,466,967, Cl. 424-258.000.
Rohner, Jean-Georges P.: *See*—
Dille, Roger M.; Richter, George N.; Estabrook, Lawrence E.; Rohner, Jean-Georges P.; and Rhodes, Harold A., 4,466,810, Cl. 48-197.00R.
Rohner, Nicholas J. Methods of applying roofing shingles. 4,466,226, Cl. 52-748.000.
Rollins, Dallas W.: *See*—
Dugge, Richard H.; and Rollins, Dallas W., 4,466,558, Cl. 222-195.000.
Roman, Robert F.: *See*—
Sovey, James S.; Rawlin, Vincent K.; and Roman, Robert F., 4,466,242, Cl. 60-202.000.
Roman, Stephan: *See*—
Cycon, James P.; Krauss, Timothy A.; and Roman, Stephan, 4,466,774, Cl. 416-134.00A.
Romer, Friedrich W., to International Harvester Co. Drive and brake system for motor vehicles with four-wheel drive. 4,466,519, Cl. 192-13.00R.
Ronden, Clifford P., to Husky Oil Operations Ltd. Method for removing solids and water from petroleum crudes. 4,466,885, Cl. 208-188.000.
Roobeek, Cornelis F.: *See*—
van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 4,467,116, Cl. 568-454.000.
Rosemount Inc.: *See*—
Frick, Roger L., 4,466,290, Cl. 73-756.000.
Markle, Richard A., 4,467,053, Cl. 521-128.000.
Ross, Gunther; and Schiementz, Manfred, to Mauser-Werke Oberndorf GmbH. Coordinate measuring machine. 4,466,190, Cl. 33-1.00M.
Ross, Sidney D., to Sprague Electric Company. AC Metallized capacitor and impregnant therefor. 4,467,395, Cl. 361-315.000.
Rottmaier, Ludwig: *See*—
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, 4,467,099, Cl. 548-264.000.
Roul, Jean-Michel: *See*—
Gigliotti, Guiseppe; and Roul, Jean-Michel, 4,467,108, Cl. 560-180.000.
Roup, Walter G. Dental simulator. 4,466,794, Cl. 433-69.000.
Roush, David H., deceased: *See*—
Long, Barry W.; Roush, David H., deceased; and Roush, Vivian J., heir, 4,466,163, Cl. 28-170.000.
Roush, M. Dean, to Cray Research, Inc. Cooling system for electronic assembly. 4,466,255, Cl. 62-259.200.
Roush, Vivian J., heir: *See*—
Long, Barry W.; Roush, David H., deceased; and Roush, Vivian J., heir, 4,466,163, Cl. 28-170.000.
Roussel Uclaf: *See*—
Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , 4,466,971, Cl. 424-266.000.
Gigliotti, Guiseppe; and Roul, Jean-Michel, 4,467,108, Cl. 560-180.000.
Roussey, Ernest H. Hydro-turbine. 4,467,217, Cl. 290-54.000.
Rovinsky, Robert S. Alternating current motor speed control. 4,467,230, Cl. 310-83.000.
Rowe International, Inc.: *See*—
Hoffman, David, 4,466,528, Cl. 194-1.00N.
Rowland-Hill, E. William; and Sheehan, Ronald T., to Sperry Corporation. Automatic sieve and chaffer adjustment in a combine harvester. 4,466,231, Cl. 56-10.200.
Roza, Engel, to U.S. Philips Corporation. Delta modulator having optimized loop filter. 4,467,291, Cl. 332-11.00D.

Rubin, Harvey, to AT&T Bell Laboratories. Switching network for interactive access and testing of subscriber loops. 4,467,147, Cl. 179-175.20C.

Ruckenbauer, Friedrich; and Krempl, Peter, to List, Hans. Test apparatus for determination of vibration characteristics of piezoelectric transducers. 4,467,271, Cl. 324-56.000.

Rudloff, Lyle L. Lateen rigged sailing board. 4,466,372, Cl. 114-39.000.

Rudolph, Dale C.; and Ray, Michael D., to Technicare Corporation. Interchangeable component identification system. 4,467,273, Cl. 324-65.00R.

Rudolph, Larry T.: *See*—
Tomaszewski, Thaddeus W.; Tremmel, Robert A.; and Rudolph, Larry T., 4,466,865, Cl. 204-51.000.

Rulseh, Roger D., to AMF Incorporated. Timing mechanism with two independent rotary outputs. 4,466,310, Cl. 74-665.0GA.

Rumble Equipment Limited: *See*—
Duff, David L. A., 4,467,259, Cl. 318-800.000.

Runzler, Jurgen: *See*—
Hepfer, Rolf; and Runzler, Jurgen, 4,466,744, Cl. 368-262.000.

Rupp, Dieter; Weeber, Wolfgang; Lissner, Paul; and Steimle, Josef, to Licentia Patent-Verwaltungs-GmbH. System for transmitting emergency calls from persons requiring assistance. 4,467,142, Cl. 179-5.00R.

Ruska Instrument Corporation: *See*—
Geren, Lorenzo D., deceased; and Worden, Raymond D., 4,466,766, Cl. 414-404.000.

Rutty, Edward C., to Stanley Works, The. True zero tape hook. 4,466,194, Cl. 33-137.00R.

Ruyak, Robert F.; Ratkowski, Stephen G.; Ciprich, Samuel D.; and Silver, Theodore R., to Autoclave Engineers, Inc. Consistometer. 4,466,276, Cl. 73-59.000.

RVS Enterprises: *See*—
Sicoli, Robert; Sicoli, Frank; and Sicoli, Eugene, 4,466,516, Cl. 190-2.000.

Ryan, Kenneth M.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,467,107, Cl. 560-170.000.

S&C Electric Company: *See*—
Jackson, Hiram S., 4,467,307, Cl. 337-30.000.

S.N.F.C.M.A.: *See*—
Camboulives, Andre A. M. L., 4,466,776, Cl. 416-221.000.

Saab-Scania Aktiebolag: *See*—
Magnusson, Karl G., 4,467,427, Cl. 364-424.100.

Saalfrank, Werner, to Siemens Aktiengesellschaft. X-ray diagnostic system comprising an image intensifier television chain. 4,467,352, Cl. 358-111.000.

Safta S.p.A.: *See*—
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,467,003, Cl. 428-64.000.

Said, Adil S.; and Schober, Antonio, to Global Banking Systems, Inc. Coin counting and sorting apparatus. 4,466,453, Cl. 133-3.00C.

Saiia, Anthony J.: *See*—
Giandenoto, Frank J.; and Saiia, Anthony J., 4,466,504, Cl. 180-273.000.

St. Germain, Ronald E.; and Zdinak, Paul, to Gould Inc. Combination handle and cover. 4,466,679, Cl. 339-44.00M.

St. Laurent, Wilfred H., Jr.: *See*—
Athanassiu, Christos; and St. Laurent, Wilfred H., Jr., 4,466,455, Cl. 137-116.500.

Saito, Seiji: *See*—
Fujii, Motoharu; Koumura, Noboru; Sato, Yasushi; Ayata, Naoki; and Saito, Seiji, 4,467,348, Cl. 358-78.000.

Saito, Shozo; Uchida, Yukimasa; Hashimoto, Kazuhiko; and Endo, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Nonvolatile semiconductor memory device and method of fabricating the same. 4,467,452, Cl. 365-184.000.

Saito, Takashi; and Hirano, Toshio, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus having a jacket opening enlarging mechanism. 4,467,465, Cl. 369-77.200.

Saito, Yasuji; and Yamanaka, Hiroomi, to Kabushiki Kaisha Nichibei. Device for driving and stopping a roll blind. 4,466,475, Cl. 160-297.000.

Sakai, Hirohumi; Sukeda, Toshiaki; Yodoshi, Hiroyuki; and Imai, Satoru, to Fujitsu Limited. Electrical connecting device. 4,466,680, Cl. 339-45.00M.

Sakai, Takamasa; and Sato, Yasuhiko, to Clarion Co., Ltd. Thin layer depositing apparatus. 4,466,876, Cl. 204-298.000.

Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. System for controlling transmission torque of a four-wheel drive vehicle. 4,466,502, Cl. 180-247.000.

Sakaki, Hideki: *See*—
Satake, Toshihiko; and Sakaki, Hideki, 4,466,544, Cl. 209-580.000.

Sakakibara, Shuji; Kondo, Toshio; Kobayashi, Akio; and Isomura, Shigenori, to Nippondenso Co., Ltd. Air-fuel ratio control for internal combustion engine. 4,466,410, Cl. 123-440.000.

Sakamoto, Hiroshi: *See*—
Asami, Shinichi; Sakamoto, Hiroshi; and Inaba, Norihiko, 4,467,339, Cl. 346-214.000.

Sakamoto, Minoru. Adjustable toilet bowl seat and footrest. 4,466,140, Cl. 4-254.000.

Sakoe, Hiroaki: *See*—
Tsuruta, Shichiro; and Sakoe, Hiroaki, 4,467,437, Cl. 364-513.500.

Sakurada, Ichiro; Kaji, Kanako; and Okada, Toshio, to Japan Atomic Energy Research Institute. Heat-resistant fiber and/or fire retardant synthetic fiber. 4,466,990, Cl. 427-35.000.

Sakurai, Atsushi, to Canon Kabushiki Kaisha. Electronically operated machine for learning foreign language vocabulary. 4,467,446, Cl. 364-900.000.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,467,464, Cl. 369-77.200.

Salam, Hassan P. A., to Unisplay S.A. Information display devices. 4,466,207, Cl. 40-449.000.

Salomonsson, Krister. Blade guide for saw blades. 4,466,323, Cl. 83-821.000.

Salzburger, Hans-Jurgen J.: *See*—
Repplinger, Wilhelm; Hubschen, Gerhard; and Salzburger, Hans-Jurgen J., 4,466,287, Cl. 73-643.000.

San-o Industrial Co., Ltd.: *See*—
Arikawa, Hiroo; and Taniguchi, Akira, 4,467,308, Cl. 337-231.000.

Sanden Corporation: *See*—
Hiraga, Masaharu, 4,466,784, Cl. 418-55.000.

Sandhaus, Sami, to CBS Biotechnic SA. Dental implant for use as a pillar in a mouth. 4,466,796, Cl. 433-173.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,466,258, Cl. 68-5.00C.

Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Apparatus for low-temperature plasma treatment of a textile product. 4,466,258, Cl. 68-5.00C.

Sandoz, Inc.: *See*—
Brand, Leonard J.; and Nadelson, Jeffrey, 4,467,096, Cl. 548-247.000.

Sandoz Ltd.: *See*—
Neumann, Peter, 4,466,972, Cl. 424-266.000.
Uehlinger, Hanspeter, 4,466,920, Cl. 260-187.000.

Sands, Timothy D.: *See*—
Dolan, James E.; and Sands, Timothy D., 4,466,423, Cl. 126-424.000.

Sano, Shigenori; and Hanzawa, Kohtaro, to Casio Computer Co., Ltd. Digital filter apparatus with resonance characteristics. 4,467,440, Cl. 364-724.000.

Santen, Sven; and Johansson, Borje, to SKF Steel Engineering Aktiebolag. Manufacture of a gas containing monoxide and hydrogen gas from a starting material containing carbon and/or hydrocarbon. 4,466,807, Cl. 48-197.00R.

Santrade Ltd.: *See*—
Danielsson, Mats P. A., 4,467,008, Cl. 428-156.000.

Sanyo Electric Co., Ltd.: *See*—
Hosoya, Nobukazu, 4,467,359, Cl. 358-159.000.
Nakata, Takeshi; Takase, Hitoshi; and Horinouchi, Atsushi, 4,467,164, Cl. 219-10.55M.

Sasaki, Chuichi, to Sasaki Nouki Kabushiki Kaisha. Disk mower. 4,466,234, Cl. 56-13.600.

Sasaki, Makoto: *See*—
Inui, Taiji; and Sasaki, Makoto, 4,466,241, Cl. 60-39.182.

Sasaki Nouki Kabushiki Kaisha: *See*—
Sasaki, Chuichi, 4,466,234, Cl. 56-13.600.

Sasamoto, Hisaya: *See*—
Tahara, Kazuo; Matsui, Takayuki; Sasamoto, Hisaya; Koharagi, Haruo; Takahashi, Noriyoshi; and Takemura, Akira, 4,467,234, Cl. 310-195.000.

Saso, Kazuo: *See*—
Ichikawa, Hiromichi; Saso, Kazuo; and Suganuma, Nobuo, 4,466,954, Cl. 424-50.000.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko; and Sakaki, Hideki, 4,466,544, Cl. 209-580.000.

Satake, Toshihiko; and Sakaki, Hideki, to Satake Engineering Co., Ltd. Photoelectric detection device for color sorting apparatus. 4,466,544, Cl. 209-580.000.

Satake, Yasuo: *See*—
Kurosu, Hirohiko; Nagata, Satoshi; and Satake, Yasuo, 4,467,454, Cl. 365-189.000.

Sato, Kazuhiro: *See*—
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.

Sato, Koji: *See*—
Nagaoka, Shinji; and Sato, Koji, 4,466,727, Cl. 354-417.000.

Sato, Masanori: *See*—
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.

Sato, Mitsuyoshi, to Seiko Instruments & Electronics Ltd. Macroanalyzer system. 4,467,199, Cl. 250-310.000.

Sato, Takashi, to Pioneer Electronic Corporation. Music reservation device for use with magnetic tape playback apparatus. 4,467,375, Cl. 360-72.100.

Sato, Toshio: *See*—
Magami, Masato; Sato, Toshio; Katayama, Sakae; and Umekawa, Osamu, 4,466,975, Cl. 424-270.000.

Sato, Yasuhiko: *See*—
Sakai, Takamasa; and Sato, Yasuhiko, 4,466,876, Cl. 204-298.000.

Sato, Yasushi: *See*—
Fujii, Motoharu; Koumura, Noboru; Sato, Yasushi; Ayata, Naoki; and Saito, Seiji, 4,467,348, Cl. 358-78.000.

Sato, Yoshikuni: *See*—
Takahashi, Toshiya; and Sato, Yoshikuni, 4,467,447, Cl. 364-900.000.

Satoh, Atsuyuki: *See*—
Tsuruoka, Takashi; Imai, Satoshi; Satoh, Atsuyuki; Watanabe, Tetsuro; Watanabe, Koji; Inouye, Shigeharu; and Niida, Taro, 4,466,913, Cl. 260-112.50R.

Saurenman, Phillip E.: *See*—
Casler, William A.; and Saurenman, Phillip E., 4,466,267, Cl. 72-368.000.

Sawada, Daisaku: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Dainaku, 4,466,405, Cl. 123-416.000.

Sawada, Tetsuya: *See*—
Tokuno, Masateru; and Sawada, Tetsuya, 4,466,320, Cl. 83-325.000.

Sawicki, Charles A.: *See*—
Kysilka, James O.; and Sawicki, Charles A., 4,467,204, Cl. 250-343.000.

Sawyer, Linda C., to Celanese Corporation. Mixed fiber length yarn. 4,466,237, Cl. 57-254.000.

Sayder, Ali C.: *See*—
Datseris, Philip S.; Sayder, Ali C.; and Palm, William J., 4,466,768, Cl. 414-729.000.

Scartazzini, Riccardo: *See*—
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,467,101, Cl. 549-76.000.

Schaefer, Richard T.; and Dutcher, Clinton H., Jr., to Schlumberger Technology Corporation. Deconvolution filter for induction log processing. 4,467,425, Cl. 364-422.000.

Schapel, Dieter, to Bayer Aktiengesellschaft. Production of molds using gel compositions with depot action based on a polyurethane matrix and relatively high molecular weight polyols. 4,466,936, Cl. 264-225.000.

Scharf, Gerhard, to Scharf, Gerhard. Chemical compounds, process for their preparation, agents containing these compounds, and their use. 4,467,085, Cl. 536-43.000.

Scharf, Klaus-Dieter: *See*—
Meier, Ludwig; Kuhn, Gebhard; and Scharf, Klaus-Dieter, 4,466,717, Cl. 353-122.000.

Schatteman, Etienne A., to Staar S. A. Two step cassette return mechanism for cassette tape decks. 4,467,378, Cl. 360-96.500.

Schering Aktiengesellschaft: *See*—
Hilmann, Juergen; Hoffmann, Rolf-Ruediger; Muetzel, Wolfgang; and Zimmermann, Ingfried, 4,466,442, Cl. 128-653.000.
Klose, Walter; and Boettcher, Irmgard, 4,466,976, Cl. 424-273.00R.
Nikolson, Robert C.; Vorbruggen, Helmut; Casals-Stenzel, Jorge; and Mannesmann, Gerda, 4,466,969, Cl. 424-263.000.

Schiementz, Manfred: *See*—
Ross, Gunther; and Schiementz, Manfred, 4,466,190, Cl. 33-1.00M.

Schill, Hermann, to Majc-Maschinenfabrik Hermann Schill GmbH. Machine for skinning bacon or the like. 4,466,344, Cl. 99-589.000.

Schilling, Erika, heir: *See*—
Schilling, Paul, deceased; and Schilling, Erika, heir, 4,466,350, Cl. 101-410.000.

Schilling, Paul, deceased; and by Schilling, Erika, heir. Sheet transfer cylinder assembly of a sheet-fed rotary printing machine having a device for correcting register of overprints. 4,466,350, Cl. 101-410.000.

Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for removing heavy metal ions and arsenic from wet-processed phosphoric acid. 4,466,948, Cl. 423-321.00R.

Schlageter, Bernhard; and Maier, Manfred, to Siemens Aktiengesellschaft. Device for the development of charge images, which are arranged on a charge image carrier, with the aid of a developing mixture consisting of toner and carrier particles. 4,466,728, Cl. 355-3.0DD.

Schlagmuller, Walter: *See*—
Babitzka, Rudolf; Polach, Wilhelm; and Schlagmuller, Walter, 4,466,390, Cl. 123-90.160.

Schlumberger Technology Corporation: *See*—
Schaefer, Richard T.; and Dutcher, Clinton H., Jr., 4,467,425, Cl. 364-422.000.

Schmidt, Helmut: *See*—
Lamatsch, Hans; Schmidt, Helmut; Ulrich, Bodo; and Braungardt, Karl-Heinz, 4,466,182, Cl. 29-596.000.

Schmidt, Robert H.; Gerlach, Leroy E.; and Fordahl, Craig A., to Data Card Corporation. System for forming an image on the surface of a plastic card. 4,467,335, Cl. 346-160.000.

Schmitz, Norbert L.: *See*—
Hucker, David J.; and Schmitz, Norbert L., 4,467,267, Cl. 322-61.000.

Schneider, Peter: *See*—
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,467,101, Cl. 549-76.000.

Schneider, Rolf: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.

Schnell, Gerhard, to bielomatik Leuze GmbH + Co. Methods and apparatus for producing stacks of sheets. 4,466,603, Cl. 270-58.000.

Schnepf, H. Ernest; and Whiteley, Helen R., to University of Washington, The Board of Regents of the. *Bacillus thuringiensis* crystal protein in *Escherichia coli* . 4,467,036, Cl. 435-317.000.

Schober, Antonio: *See*—
Said, Adil S.; and Schober, Antonio, 4,466,453, Cl. 133-3.00C.

Schoch, Gregor, to Bobst SA. Drive system for a cutting station in a platen press. 4,466,318, Cl. 83-62.000.

Scholz, Siegfried: *See*—
Lauermann, Georg; Scholz, Siegfried; and Koch, Ferdinand, 4,466,959, Cl. 424-150.000.

Schossler, Werner: *See*—
Heinemann, Otto; Heiringhoff, Burkhard; Lucke, Helmut; Schossler, Werner; and Krumme, Helmut, 4,466,750, Cl. 384-117.000.

Schramm, Herbert: *See*—
Aures, Reinhard; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,466,407, Cl. 123-425.000.

Schreder, Felix: *See*—
Fischer, Karl; and Schreder, Felix, 4,467,180, Cl. 219-449.000.
Fischer, Karl; and Schreder, Felix, 4,467,181, Cl. 219-451.000.

Schroeck, Calvin W., to Lubrizol Corporation, The. Metal salts of lower dialkylphosphorodithioic acids. 4,466,895, Cl. 252-32.70E.

Schroll, Craig R., to Electric Power Research Institute. Manifold dielectric barrier for a fuel cell electrical power generation system. 4,467,018, Cl. 429-18.000.

Schubert & Salzer: *See*—
Husges, Gerd; Hofer, Horst; and Hoeber, W. Gerhard, 4,466,575, Cl. 242-18.0PW.

Schuierer, Manfred, to Bruckner Apparatebau GmbH. Method and apparatus for rinsing textile material. 4,466,149, Cl. 8-151.000.

Schuler, Norman W.; and Scupp, Gary T., to Polaroid Corporation. Patterned polarizer having differently dyed areas. 4,466,704, Cl. 350-398.000.

Schuster, Heinz G.: *See*—
Herbort, Hans-Joachim; and Schuster, Heinz G., 4,466,814, Cl. 55-90.000.

Schutter, Klaas: *See*—
Appel, Peter W.; Den Outer, Robert D.; Schutter, Klaas; and Broekhoff, Johan C. P., 4,466,897, Cl. 252-108.000.

Schutz, Eckart F.: *See*—
Haller, Albert H.; and Schutz, Eckart F., 4,466,989, Cl. 427-185.000.

Schwander, Hansrudolf, to Ciba-Geigy Corporation. s-Triazines. 4,467,088, Cl. 544-197.000.

Schwebe, Gunter: *See*—
Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Neberle, Klaus; Ochs, Heinrich; and Schwebe, Gunter, 4,466,347, Cl. 101-148.000.

Schweiger, Peter: *See*—
Maurer, Thomas; Lob, Erwin; and Schweiger, Peter, 4,467,209, Cl. 235-487.000.

Scott, Richard L., to Phillips Petroleum Company. Predetector reservoir for chromatographic analysis instrument. 4,467,038, Cl. 436-115.000.

Scupp, Gary T.: *See*—
Schuler, Norman W.; and Scupp, Gary T., 4,466,704, Cl. 350-398.000.

Sebak, Edward C.: *See*—
Matyja, Frank E.; and Sebak, Edward C., 4,466,473, Cl. 152-354.00R.

Seco Industries, Inc.: *See*—
Moss, Theron C.; Boring, Earl; and Tomm, Irwin, 4,466,152, Cl. 15-229.00A.

Sei, Kazuo: *See*—
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, 4,467,061, Cl. 524-87.000.

Seibicke, Horst, to Robert Bosch GmbH. Device for wiping a vehicle window. 4,466,153, Cl. 15-250.160.

Seidl, Robert M.: *See*—
Mross, James J.; Traeder, Howard F.; and Seidl, Robert M., 4,466,299, Cl. 74-5.700.

Seiko Instruments & Electronics Ltd.: *See*—
Sato, Mitsuyoshi, 4,467,199, Cl. 250-310.000.

Seiko Koki Kabushiki Kaisha: *See*—
Nagaoka, Shinji; and Sato, Koji, 4,466,727, Cl. 354-417.000.

Seimiya, Ryubun; Inowa, Shigeru; Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Copying apparatus. 4,467,333, Cl. 346-154.000.

Selenia, Industrie Elettroniche Associate, S.p.A.: *See*—
Cozzi, Gianfranco, 4,467,290, Cl. 330-290.000.

Self, James E.: *See*—
Clark, Albert R.; Ernst, William A.; Mitrovich, Svetislav; and Self, James E., 4,466,607, Cl. 271-225.000.

Sellers, Gordon. Method of open cut mining. 4,466,669, Cl. 299-7.000.

Sendelbach, Lee A.: *See*—
Regehr, John L.; and Sendelbach, Lee A., 4,467,448, Cl. 364-900.000.

Sera, Toshikuni: *See*—
Imanari, Makoto; Oshida, Bunzi; Arima, Yutaku; Tanaka, Hirokazu; Todo, Yoshinori; Kobayashi, Norihisa; and Sera, Toshikuni, 4,466,947, Cl. 423-239.000.

Shang, Jer-Yu; Mei, Joseph S.; Slagle, Frank D.; and Notestein, John E., to United States of America, Energy. Loop-bed combustion apparatus. 4,466,360, Cl. 110-264.000.

Sharp, Bernard C., to Parker-Hannifin Corporation. Impact-displaceable rear view mirror mounting. 4,466,594, Cl. 248-484.000.

Sharp Kabushiki Kaisha: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Doi, Keiichiro; and Tanaka, Seiji, 4,467,162, Cl. 219-10.49R.
Ohta, Kenji; Deguchi, Toshihisa; and Takahashi, Akira, 4,467,383, Cl. 360-131.000.

Shasta Industries, Inc.: *See*—
Gould, H. Daniel, 4,466,142, Cl. 4-490.000.
Shatterproof Glass Corporation: *See*—
McKelvey, Harold E., 4,466,877, Cl. 204-298.000.
Shaw, Rick L.: *See*—
Sweeney, William T.; Shaw, Rick L.; and Webb, Frederick A., 4,466,759, Cl. 406-15.000.
Shear, Stephen C. Technique for aiding in inserting a plant pot into and removing it from a plant hanger. 4,466,217, Cl. 47-58.000.
Sheehan, Ronald T.: *See*—
Rowland-Hill, E. William; and Sheehan, Ronald T., 4,466,231, Cl. 56-10.200.
Sheets, Laurence L., to AT&T Bell Laboratories. Compensation method and apparatus for use with nonideal test access lines. 4,467,149, Cl. 179-175.230.
Shell Oil Company: *See*—
Fletcher, Robert A., 4,467,066, Cl. 524-371.000.
Johnson, Thomas H., 4,467,047, Cl. 502-246.000.
Johnson, Thomas H., 4,467,048, Cl. 502-246.000.
Pilgram, Kurt H.; and Skiles, Richard D., 4,467,104, Cl. 549-462.000.
Sundelin, Kurt G. R.; and Bozarth, Gene A., 4,466,823, Cl. 71-115.000.
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,466,907, Cl. 502-74.000.
van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 4,467,116, Cl. 568-454.000.
Shelnut, James: *See*—
Huang, Jen-chi; and Shelnut, James, 4,467,028, Cl. 430-302.000.
Shelton, Robert Q., to Halliburton Company. Fluid-jetting apparatus. 4,466,572, Cl. 239-186.000.
Shen, John C. S.: *See*—
Ottman, John C.; and Shen, John C. S., 4,466,218, Cl. 51-395.000.
Shiba, Haruo, to TDK Electronics Co., Ltd. Tape guide for magnetic tape cartridge. 4,466,582, Cl. 242-197.000.
Shibata, Tsutomu, to Olympus Optical Co., Ltd. Signal detection system for use in an optically reproducing apparatus. 4,467,462, Cl. 369-45.000.
Shibuya, Kiyoshi; Shimanaka, Hiroshi; and Tanaami, Yoshiaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Kawasaki Seitetsu Kabushiki Kaisha. Winding machine. 4,466,578, Cl. 242-65.000.
Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Electromagnetic spring-wound clutch. 4,466,522, Cl. 192-36.000.
Shigeta, Yoshihiro: *See*—
Haraguchi, Shosuke; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Tosaka, Yoichi, 4,466,719, Cl. 354-173.110.
Shii, Hikaru; and Sugimoto, Humio, to Furukawa Electric Co., Ltd., The. Oil-impregnated polyolefin film for electric insulation and manufacturing method for the same. 4,467,010, Cl. 428-212.000.
Shima, George T., to Burroughs Corporation. Bit addressable variable length memory system. 4,467,443, Cl. 364-900.000.
Shimada, Masakichi: *See*—
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, 4,467,061, Cl. 524-87.000.
Shimanaka, Hiroshi: *See*—
Shibuya, Kiyoshi; Shimanaka, Hiroshi; and Tanaami, Yoshiaki, 4,466,578, Cl. 242-65.000.
Shimano Industrial Company Limited: *See*—
Toda, Junichi, 4,466,580, Cl. 242-84.21R.
Shimirak, Gerald L., to Raychem Corporation. Protection of cable splice. 4,466,843, Cl. 156-48.000.
Shimizu, Shigeo: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,466,932, Cl. 264-29.300.
Shimizu, Takao: *See*—
Mizuno, Takaji; Kato, Yoshiaki; and Shimizu, Takao, 4,467,176, Cl. 219-137.710.
Shindaiwa Kogyo Company, Ltd.: *See*—
Morimoto, Hiroyuki, 4,466,187, Cl. 30-124.000.
Shinkai, Ichiro: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,467,107, Cl. 560-170.000.
Shinozaki, Toshiaki: *See*—
Sugihara, Kazuyoshi; Tojo, Toru; Mori, Ichiro; and Shinozaki, Toshiaki, 4,467,210, Cl. 250-492.200.
Shipley Company: *See*—
Valayil, Silvester P.; and Aronson, Vita, 4,467,067, Cl. 524-435.000.
Shirahata, Akihiko; and Kishimoto, Keiichi, to Dow Corning Corporation. Organopolysiloxane photosensitizers and methods for their preparation. 4,467,082, Cl. 528-43.000.
Shirk, Raymond A.: *See*—
Belke, Robert E., Jr.; Hill, Richard J.; Shirk, Raymond A.; and Smith, David P., 4,466,874, Cl. 204-192.0EC.
Shockley, David L.: *See*—
Hedges, Richard A.; Shockley, David L.; Fralick, Stanley C.; and Kane, Paul H., 4,467,424, Cl. 364-412.000.
Showa Electric Wire & Cable Co., Ltd.: *See*—
Yokoyama, Takeo; Imai, Ichiya; and Asaoka, Hideaki, 4,467,295, Cl. 333-141.000.
Shu, Winston R., to Mobil Oil Corporation. Viscous oil recovery method. 4,466,485, Cl. 166-272.000.
Shultz, Jay S., to Kimberly-Clark Corporation. Surgical drape with instrument support. 4,466,430, Cl. 128-132.00D.
Shwayder, Warren M. Blade edge wear clips. 4,466,533, Cl. 198-676.000.
Siccardi, Alberto: *See*—
Pallaroni, Francesco; Baldini, Luciano; and Siccardi, Alberto, 4,467,003, Cl. 428-64.000.
Sicoli, Eugene: *See*—
Sicoli, Robert; Sicoli, Frank; and Sicoli, Eugene, 4,466,516, Cl. 190-2.000.
Sicoli, Frank: *See*—
Sicoli, Robert; Sicoli, Frank; and Sicoli, Eugene, 4,466,516, Cl. 190-2.000.
Sicoli, Robert; Sicoli, Frank; and Sicoli, Eugene, to RVS Enterprises. Multi-purpose sunblanket and tote bag. 4,466,516, Cl. 190-2.000.
Siebert, Rainer; and Bock, Erich, to Diehl GmbH & Co. Arrangement for the connection of an electrode to a support. 4,467,401, Cl. 361-427.000.
Siebold, Horst, to Siemens Aktiengesellschaft. High-frequency magnet system for nuclear spin tomography. 4,467,282, Cl. 324-309.000.
Siemens Aktiengesellschaft: *See*—
Borstel, Heinz-Dieter, 4,467,145, Cl. 179-107.00R.
Dathe, Joachim; and Holtschmidt, Walter, 4,466,839, Cl. 148-1.500.
Harbauer, Werner, 4,467,300, Cl. 335-131.000.
Herberg, Helmut, 4,467,343, Cl. 357-38.000.
Lamatsch, Hans; Schmidt, Helmut; Ulrich, Bodo; and Braungardt, Karl-Heinz, 4,466,182, Cl. 29-596.000.
Meindl, Gerhard, 4,466,681, Cl. 339-97.00R.
Saalfrank, Werner, 4,467,352, Cl. 358-111.000.
Schlageter, Bernhard; and Maier, Manfred, 4,466,728, Cl. 355-3.0DD.
Siebold, Horst, 4,467,282, Cl. 324-309.000.
Stieber, Volker, 4,467,197, Cl. 250-305.000.
Troost, Marcel A., 4,467,471, Cl. 370-68.000.
Waas, Oskar G., 4,467,470, Cl. 370-66.000.
Wendt, Peter, 4,467,472, Cl. 370-97.000.
Zeitraeg, Rolf, 4,467,318, Cl. 340-347.0DD.
Siewert, G. A. Horst; Dietrich, Horst; Munz, Wolf-Dieter; and Goebel, Jorg, to Demetron Gesellschaftfur Electronik-Werstoffe mbh; and Leybold-Heraeus GmbH. Multicomponent alloy for sputtering targets. 4,466,940, Cl. 420-507.000.
Siffroi, Lucien: *See*—
Belbel, Elie; Fechant, Louis; Haury, Andre ; Lauraire, Michel; and Siffroi, Lucien, 4,467,298, Cl. 335-16.000.
Sig Societe Industrielle Suisse: *See*—
Pasquini, Sandro, 4,466,355, Cl. 104-12.000.
Signode Corporation: *See*—
Huson, Gale W., 4,466,535, Cl. 206-83.500.
Silva, Robert E. System and method of vaporizing liquid for delivery to an internal combustion engine. 4,466,386, Cl. 123-25.00B.
Silver, Theodore R.: *See*—
Ruyak, Robert F.; Ratkowski, Stephen G.; Ciprich, Samuel D.; and Silver, Theodore R., 4,466,276, Cl. 73-59.000.
Silverman, Harold I.; and Steinberg, Edward L., to Thompson Medical Co., Inc. Analgesic-diuretic compositions. 4,466,960, Cl. 424-166.000.
Silverstein, Seth D.; and Prener, Jerome S., to General Electric Company. High-pressure sodium lamp with improved IR reflector. 4,467,238, Cl. 313-25.000.
Simes S.p.A.: *See*—
Casagrande, Cesare; and Ferrari, Giorgio, 4,467,094, Cl. 546-334.000.
Simmat, Fritz: *See*—
Christiansen, Uwe; Rau, Karlheinz; and Simmat, Fritz, 4,466,700, Cl. 350-310.000.
Simotamari, Akira: *See*—
Nakabayashi, Yasuyuki; Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; Simotamari, Akira; and Matsuno, Izumi, 4,466,199, Cl. 34-9.000.
Simson, Dionizy, to Sulzer Brothers. Metering drum for filamentary material. 4,466,576, Cl. 242-47.010.
Sindermann, Paul: *See*—
Juretzek, Heinz; Kriesten, Wolfgang; and Sindermann, Paul, 4,466,330, Cl. 86-20.00R.
Sinelschikov, Andrei K.: *See*—
Andreev, Anatoly A.; Gavrilov, Alexei G.; Galitskaya, Galina K.; Zhed, Viktor P.; Sinelschikov, Andrei K.; Padalka, Valentin G.; and Tolok, Vladimir T., 4,466,991, Cl. 427-38.000.
Singer Company, The: *See*—
Houser, John M., 4,466,686, Cl. 339-196.00M.
Larsen, Robert H., 4,466,371, Cl. 112-302.000.
Singer, Edouard. Lifting device, in particular, a tackle block. 4,466,599, Cl. 254-391.000.
Singer, Loren A., Jr., to Porta Systems Corp. Self-centering plug and socket. 4,466,688, Cl. 339-252.00R.
Sinyard, Michael W. Bicycle headset including a stem seal. 4,466,629, Cl. 280-279.000.
Sir W. G. Armstrong Whitworth & Company, Ltd.: *See*—
Tryhorn, Donald W., 4,466,388, Cl. 123-51.0BB.
Sitt, Rudiger: *See*—
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,466,964, Cl. 424-246.000.
Sivov, Nikolai A.: *See*—
Zhuk, David S.; Keppen, Vera A.; Sivov, Nikolai A.; Tereschenko, Gennady F.; Golubkov, Igor M.; and Timofeev, Valery E., 4,467,115, Cl. 564-512.000.
SKF Kugellagerfabriken GmbH: *See*—
Hans, Rudiger; and Haas, Roland, 4,466,503, Cl. 180-259.000.
SKF Steel Engineering Aktiebolag: *See*—
Santen, Sven; and Johansson, Borje, 4,466,807, Cl. 48-197.00R.

Skiles, Richard D.: *See*—
Pilgram, Kurt H.; and Skiles, Richard D., 4,467,104, Cl. 549-462.000.

Skubitz, Frank L.; and Deluhery, James G., to Medtronic, Inc. In-line and bifurcated cardiac pacing lead connector. 4,466,441, Cl. 128-419.00P.

Slagle, Frank D.: *See*—
Shang, Jer-Yu; Mei, Joseph S.; Slagle, Frank D.; and Notestein, John E., 4,466,360, Cl. 110-264.000.

Slaugh, Lynn H.: *See*—
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,466,907, Cl. 502-74.000.

Slaughter Knife Co., Inc.: *See*—
Slaughter, Richard L., 4,466,561, Cl. 224-163.000.

Slaughter, Richard L., to Slaughter Knife Co., Inc. Belt buckle knife. 4,466,561, Cl. 224-163.000.

Sletzinger, Meyer: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,467,107, Cl. 560-170.000.

Smith, David P.; and von Behren, Robert A., to Minnesota Mining and Manufacturing Company. Belt for belt-driven recording tape pack. 4,466,564, Cl. 226-170.000.

Smith, David P.: *See*—
Beike, Robert E., Jr.; Hill, Richard J.; Shirk, Raymond A.; and Smith, David P., 4,466,874, Cl. 204-192.0EC.

Smith, Dennis J.: *See*—
Smith, James L.; Masters, Bill S.; and Smith, Dennis J., 4,467,046, Cl. 502-174.000.

Smith, Donald O.; and Harte, Kenneth J., to Control Data Corporation. Method and apparatus for exposing multi-level registered patterns interchangeably between stations of a multi-station electron-beam array lithography (EBAL) system. 4,467,211, Cl. 250-492.200.

Smith, Howard W.: *See*—
Douthart, Robert H.; and Smith, Howard W., 4,467,257, Cl. 318-774.000.

Smith, James D. B., to Westinghouse Electric Corp. Resinous copolymer insulating compositions. 4,467,072, Cl. 525-117.000.

Smith, James L.; Masters, Bill S.; and Smith, Dennis J. Dehydrogenation catalyst. 4,467,046, Cl. 502-174.000.

Smith, Joseph E., to O & S Manufacturing Company. Hemispherical ball and socket joint. 4,466,755, Cl. 403-36.000.

Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; and Young, Rodney C., 4,466,970, Cl. 424-263.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,467,087, Cl. 544-182.000.

Smith, Lawther O.: *See*—
Molders, Werner; Freitag, Herbert; and Smith, Lawther O., 4,466,514, Cl. 188-320.000.

Smith and Nephew Associated Companies Limited: *See*—
Tharrat, John; and Harlock, Sally-Jane, 4,466,431, Cl. 128-156.000.

Smith, Raymond R., Jr.: *See*—
Baugher, Robert C.; Kiemer, Ralph F.; and Smith, Raymond R., Jr., 4,466,531, Cl. 198-486.000.

Smith, Robert L.; and Mozingo, Melvin B., to Emhart Industries, Inc. Method and system for controlling an apparatus. 4,467,423, Cl. 364-400.000.

Smith, Stuart B., to Thermocell Development, Ltd. Polyisocyanurate-coated foam insulation board and method of preparation. 4,467,014, Cl. 428-314.400.

Smolanoff, Joel R., to Rohm and Haas Company. Arthropod repellents. 4,466,967, Cl. 424-258.000.

Snellman, Donald L.; and Pearson, Bernard A., to Snellman, Donald L. Sheet jogging apparatus. 4,466,606, Cl. 271-221.000.

Snipes, Wallace: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,466,953, Cl. 424-28.000.

Sochting, Klaus. Dispensing method and apparatus for controllable dispensing of oxygen and liquids in biological systems. 4,466,556, Cl. 222-1.000.

Societe Anonyme des Usines Chausson: *See*—
Poitier, Gerard C. M., 4,466,754, Cl. 403-11.000.

S.A. Radiall: *See*—
Tronchon, Christian, 4,466,685, Cl. 339-177.00R.

Societe d'Application et de Developpement de Techniques Nouvelles, S.A.D.E.V.: *See*—
Finaz, Gilles; Michon, Robert; and Rasclard, Michel, 4,467,051, Cl. 521-77.000.

Societe D'Assistance Technique Pour Produits Nestle S.A.: *See*—
Guggenbuehler, Max; and Heyland, Sven, 4,466,986, Cl. 426-533.000.

Societe Nationale des Poudres et Explosifs: *See*—
Dalet, Francis; and Ducourneau, Bernard, 4,466,352, Cl. 102-288.000.

Societe Nationale D'Etude et de Construction de Moteurs D'Aviation ("S.N.E.C.M.A."): *See*—
Camboulives, AndreA. M. L.; and Mandet, Gerard M. F., 4,466,573, Cl. 239-265.410.

Societe Suisse Pour L'Industrie Horlogere Management Services S.A.: *See*—
Tu Xuan, Mai, 4,467,255, Cl. 318-696.000.

Soclof, Sidney I., to Rockwell International Corporation. Method of making extremely small area PNP lateral transistor by angled implant of deep trenches followed by refilling the same with dielectrics. 4,466,178, Cl. 29-576.00B.

Soclof, Sidney I., to Rockwell International Corporation. Method of manufacturing punch through voltage regulator diodes utilizing shaping and selective doping. 4,466,180, Cl. 29-580.000.

Soinski, Alexander F.; Soinski, Frederick J.; and Soinski, William R. Wireline core barrel. 4,466,497, Cl. 175-246.000.

Soinski, Frederick J.: *See*—
Soinski, Alexander F.; Soinski, Frederick J.; and Soinski, William R., 4,466,497, Cl. 175-246.000.

Soinski, William R.: *See*—
Soinski, Alexander F.; Soinski, Frederick J.; and Soinski, William R., 4,466,497, Cl. 175-246.000.

Solartron Electronic Group Limited, The: *See*—
Stansfeld, James W., 4,466,272, Cl. 73-32.00A.

Sollner, Gerhard, to U.S. Philips Corporation. Device for rotating a sunshade strip enclosed in an evacuated glass tube. 4,466,474, Cl. 160-107.000.

Sollog, Fred N., to Staley Development Corporation. Automatic floor-leveling means for a cable-suspended elevator. 4,466,510, Cl. 187-29.00R.

Somemiya, Akiyoshi: *See*—
Miyashita, Shunitsu; and Somemiya, Akiyoshi, 4,467,076, Cl. 525-391.000.

Son, Pyong N.: *See*—
Lai, John T.; and Son, Pyong N., 4,466,916, Cl. 260-239.30R.

Sonoda, Keiji, to Nichifu Terminal Industries Co., Ltd. Integrally formed insulator assembly and method of manufacturing the same. 4,466,692, Cl. 339-276.0SF.

Sony Corporation: *See*—
Okada, Takashi, 4,467,289, Cl. 330-288.000.
Yano, Hajime, 4,467,463, Cl. 369-45.000.

Sood, Lal C., to Motorola, Inc. Buffer circuit. 4,467,455, Cl. 365-189.000.

Soula, Gerard: *See*—
Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,467,055, Cl. 523-200.000.

Source Technologies Corporation: *See*—
Kramer, Milo G.; Ballard, Albert S.; and Kramer, Gideon A., 4,466,716, Cl. 353-94.000.

Southam, Barry J., to Wahlco International Inc. Gas conditioning apparatus. 4,466,815, Cl. 55-122.000.

Sovey, James S.; Rawlin, Vincent K.; and Roman, Robert F., to United States of America, National Aeronautics and Space Administration. Ring-cusp ion thruster with shell anode. 4,466,242, Cl. 60-202.000.

Sowa, Joseph P.: *See*—
Sowa, Michael J.; and Sowa, Joseph P., 4,466,651, Cl. 294-82.00R.

Sowa, Michael J.; and Sowa, Joseph P. Block. 4,466,651, Cl. 294-82.00R.

Spangle, Lloyd B., to Dow Chemical Company, The. Lightweight cement slurry and method of use. 4,466,833, Cl. 106-88.000.

Specht, David F.: *See*—
D'Aurora, Joseph R.; and Specht, David F., 4,466,515, Cl. 273-256.000.

Special Products Engineering Corporation: *See*—
Cogswell, John; and Fokos, Robert F., 4,466,319, Cl. 83-116.000.

Sperry Corporation: *See*—
Bell, Wayne D.; and McFarland, Thomas K., 4,467,322, Cl. 340-701.000.
Lang, Warren R., 4,467,302, Cl. 335-212.000.
Lustig, Claude D., 4,467,325, Cl. 340-794.000.
Osselaere, Guy H. J.; and Danhieux, Daniel M., 4,466,230, Cl. 56-10.200.
Rowland-Hill, E. William; and Sheehan, Ronald T., 4,466,231, Cl. 56-10.200.

Spevak, Sidney M. Animal feces disposal device. 4,466,647, Cl. 294-1.0BB.

Spiegelman, Kathleen Y. Top opening totebag body rest. 4,466,517, Cl. 190-8.000.

Spongr, Jerry J.: *See*—
Joffe, Boris B.; Spongr, Jerry J.; and Ivasyuk, Boris N., 4,467,198, Cl. 250-308.000.

Sprague Electric Company: *See*—
Chalfin, Edward; and Gontowski, Walter S., Jr., 4,467,191, Cl. 250-214.00A.
Dumery, Stefaan D., 4,466,284, Cl. 73-313.000.
Ross, Sidney D., 4,467,395, Cl. 361-315.000.

Spreading Machine Exchange, Inc.: *See*—
Costigan, Conrad A., 4,466,602, Cl. 270-31.000.

Sprecker, Mark A.; Belko, Robert P.; and Greene, Roger E., to International Flavors & Fragrances Inc. Isopropyl tetramethylindan musk, organoleptic use thereof. 4,466,908, Cl. 252-522.00R.

Spridco, Dale R., to Falk Corporation, The. Marine propulsion control system for low speed maneuvering. 4,466,525, Cl. 192-0.076.

Staar S. A.: *See*—
Schatteman, Etienne A., 4,467,378, Cl. 360-96.500.

Stabilus GmbH: *See*—
Molders, Werner; Freitag, Herbert; and Smith, Lawther O., 4,466,514, Cl. 188-320.000.

Staempfli, Jackie, to Valinor, S.A. Device for measuring or detecting the degree of inclination of an object. 4,466,197, Cl. 33-377.000.

Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Adam, Wilhelm, to Hoechst Aktiengesellschaft. Particulate agent for impeding the combustibility of combustible materials. 4,467,056, Cl. 523-208.000.

Stafford, James A.; Neiss, Richard W.; and Coolidge, Daniel S., to Network Control Corporation. Telephone line analyzer. 4,467,148, Cl. 179-175.30R.

Stahler, Fritz: *See*—
Kleinhammer, Gerd; Deutsch, Gerlinde; Linke, Hans-Ralf; Stahler, Fritz; and Gruber, Wolfgang, 4,467,030, Cl. 435-7.000.

Stahler, Gerhard: *See—*
Koch, Manfred; and Stahler, Gerhard, 4,467,098, Cl. 548-263.000.
Staley Development Corporation: *See—*
Sollog, Fred N., 4,466,510, Cl. 187-29.00R.
Standard Oil Company, The: *See—*
Chan, Keng S.; and Majoros, Stephen J., 4,466,892, Cl. 252-8.55D.
Jageler, Alfred H., 4,466,495, Cl. 175-59.000.
Johnson, Philip W., 4,467,460, Cl. 367-56.000.
Standard Oil Company (Indiana): *See—*
Brooks, Gary T.; and Cole, Bill W., 4,467,011, Cl. 428-245.000.
Goddin, Clifton S., Jr.; Turek, Edward A.; and George, Boyd A., 4,466,946, Cl. 423-228.000.
Hunt, Mack W.; and West, Charles T., 4,466,901, Cl. 252-32.70E.
Puskas, Imre; and James, David E., 4,467,110, Cl. 562-487.000.
Puskas, Imre; and James, David E., 4,467,111, Cl. 562-487.000.
Stanley, Philip E.: *See—*
Cushing, David E.; Lemay, Richard A.; Stanley, Philip E.; and Woods, William E., 4,467,416, Cl. 364-200.000.
Woods, William E.; Cushing, David E.; Lemay, Richard A.; and Stanley, Philip E., 4,467,417, Cl. 364-200.000.
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De Carolis, Joseph P.; and Billings, Lawrence L., 4,466,523, Cl. 192-43.100.
Rutty, Edward C., 4,466,194, Cl. 33-137.00R.
Stannett, Vivian: *See—*
Williams, Joel; Dunn, Terry; and Stannett, Vivian, 4,467,065, Cl. 524-296.000.
Stansfeld, James W., to Solartron Electronic Group Limited, The. Fluid density transducer. 4,466,272, Cl. 73-32.00A.
Staples, Edward J.: *See—*
De Wames, Roger E.; and Staples, Edward J., 4,467,235, Cl. 310-313.00D.
Starkey, Walter D. Hydrothermal treatment facility. 4,466,141, Cl. 4-488.000.
Starr, Frank C., Jr. Sliding film rheometer. 4,466,274, Cl. 73-54.000.
Staude, Eckhardt, to Eva Staude, Firma. Film developing apparatus having continuous circulation of developing liquids. 4,466,722, Cl. 354-299.000.
Stauffer Chemical Company: *See—*
Band, Elliot I., 4,467,044, Cl. 502-111.000.
Howard, John A., 4,466,216, Cl. 47-58.000.
Stayner, Robert A., to Chevron Research Company. Oil-in-water microemulsion fluid. 4,466,909, Cl. 252-49.500.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., to Steck Manufacturing Co., Inc. Hinge pin removal method. 4,466,169, Cl. 29-426.500.
Steck, Laurence D.: *See—*
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 4,466,169, Cl. 29-426.500.
Steck Manufacturing Co., Inc.: *See—*
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Steck, Raymond E.: *See—*
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Steelastic Company, The: *See—*
Baugher, Robert C.; Kiemer, Ralph F.; and Smith, Raymond R., Jr., 4,466,531, Cl. 198-486.000.
Steimle, Josef: *See—*
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Stein, Richard J.: *See—*
Poulsen, Peter D.; Stein, Richard J.; and Pease, Robert E., 4,466,667, Cl. 299-1.000.
Steinberg, Edward L.: *See—*
Silverman, Harold I.; and Steinberg, Edward L., 4,466,960, Cl. 424-166.000.
Steinberg, Richard W., to Hiniker Company. Earthworking implement having spring biased arms. 4,466,492, Cl. 172-551.000.
Stephens, Roger J.: *See—*
Cavalla, John F.; and Stephens, Roger J., 4,466,963, Cl. 424-244.000.
Stieber, Volker, to Siemens Aktiengesellschaft. Apparatus for monitoring the acceleration energy of an electron accelerator. 4,467,197, Cl. 250-305.000.
Stitt, Robert M., to Burr-Brown Corporation. Resistor ladder network. 4,467,286, Cl. 330-86.000.
Stober, Bernd, to Gebr. Stober. Infinitely variable friction-cone transmission with movable flange-mounted motor. 4,466,303, Cl. 74-191.000.
Stocchiero, Olimpio. Cell-container and cell-lid for electric-accumulators particularly for those meant for traction. 4,467,021, Cl. 429-175.000.
Stoelzer, Rainer, to Hydromatik GmbH. Oblique-shaft axial piston machine having a follower plate for the cylinder drum. 4,466,338, Cl. 91-506.000.
Stollenwerk, Ulrich: *See—*
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Stopper, Herbert, to Burroughs Corporation. Wafer scale integrated circuit. 4,467,400, Cl. 361-403.000.
Storage Technology Corporation: *See—*
White, Barry B., 4,467,421, Cl. 364-200.000.
Stout, David M.; and Matier, William L., to American Hospital Supply Corporation. Phthalazine compounds, compositions and use. 4,466,965, Cl. 424-250.000.
Straub, Paul J.: *See—*
Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., 4,466,643, Cl. 292-92.000.
Strickland, James C. Distortion-free complemented error feedback amplifier and method. 4,467,288, Cl. 330-149.000.
Strickland, Leon; Foglesong, Robert M.; and Arden, Terry D. Loader for muzzle-loading firearms. 4,466,209, Cl. 42-90.000.
Strobush, Victor H., to Honeywell Inc. Impact probe mechanism for ammunition fuzing. 4,466,351, Cl. 102-275.000.
Stuckler, Gerd. Feed mechanism for parts. 4,466,530, Cl. 198-472.000.
Stymne, Hans: *See—*
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Sugihara, Kazuyoshi; Tojo, Toru; Mori, Ichiro; and Shinozaki, Toshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron-beam image transfer device. 4,467,210, Cl. 250-492.200.
Sugimoto, Humio: *See—*
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Sugiura, Yuzuru: *See—*
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Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,467,464, Cl. 369-77.200.
Sukatsch, Dieter: *See—*
Voelskow, Hartmut; and Sukatsch, Dieter, 4,467,034, Cl. 435-139.000.
Sukeda, Toshiaki: *See—*
Sakai, Hirohumi; Sukeda, Toshiaki; Yodoshi, Hiroyuki; and Imai, Satoru, 4,466,680, Cl. 339-45.00M.
Sullivan, Donald B.: *See—*
Thorley, Graham R.; and Sullivan, Donald B., 4,466,771, Cl. 414-787.000.
Sullivan, James B., to T. D. Williamson, Inc. Closure for a cylindrical opening having improved venting means. 4,466,550, Cl. 220-206.000.
Sulzer Brothers: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
Uehara, Kenichiro; and Nasu, Yoshihiro, 4,467,280, Cl. 324-206.000.
Summers, Larry E., to GRM Industries, Inc. Powered ashtray assembly. 4,466,449, Cl. 131-237.000.
Sundelin, Kurt G. R.; and Bozarth, Gene A., to Shell Oil Company. Control of unwanted sicklepod plants. 4,466,823, Cl. 71-115.000.
Sundstrand Corporation: *See—*
Eiler, Alan H., 4,466,337, Cl. 91-506.000.
Hucker, David J.; and Schmitz, Norbert L., 4,467,267, Cl. 322-61.000.
Sundstrand Data Control, Inc., unit of Sundstrand Corporation: *See—*
Harja, Arne M., 4,467,381, Cl. 360-106.000.
Suroff, Leonard W.: *See—*
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Suzuki, Hidetaka: *See—*
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Suzuki, Keiichi: *See—*
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Suzuki, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Shibaura Denki Kabushiki Kaisha. Charge transfer imaging device with blooming overflow drain beneath transfer channel. 4,467,341, Cl. 357-24.000.
Suzuki, Takashi; Kitagishi, Nozomu; and Matsumura, Susumu, to Canon Kabushiki Kaisha. Device for splitting light from an objective lens. 4,467,188, Cl. 250-204.000.
Svendsgaard, Roger W., to Morrill, Albin H., a part interest. Roofing remover. 4,466,188, Cl. 30-172.000.
Swearingen, Judson S., Jr. Remote automobile window control. 4,467,249, Cl. 318-282.000.
Swedo, Raymond J.: *See—*
House, David W.; and Swedo, Raymond J., 4,466,910, Cl. 252-500.000.
Sweeney, William T.; Shaw, Rick L.; and Webb, Frederick A., to Conoco Inc. Method and apparatus for sequence control of vertical movements of slurried particulates. 4,466,759, Cl. 406-15.000.
Swenson, Clark E.: *See—*
Kasner, William H.; Racki, Daniel J.; and Swenson, Clark E., 4,466,739, Cl. 356-138.000.
Swift, Harold E.: *See—*
Occelli, Mario L.; and Swift, Harold E., 4,466,884, Cl. 208-120.000.
Swindal, James L.: *See—*
Grantham, Daniel H.; and Swindal, James L., 4,467,394, Cl. 361-283.000.
Swindle, Elro M. Control system for regulating water heater operation in accordance with anticipated demand. 4,467,178, Cl. 219-330.000.
Switsen, Henry N. Video tape recorder signal processor. 4,467,358, Cl. 358-153.000.
Sylvan, Richard: *See—*
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,466,675, Cl. 312-263.000.
Syme, Duncan C., to Vermont Castings, Inc. Cooking method and apparatus for use with wood-burning stove. 4,466,419, Cl. 126-4.000.

Syminex (Societe Anonyme): *See*—
Kermabon, Andre J., 4,466,484, Cl. 166-60.000.
Syntex (U.S.A.) Inc.: *See*—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,466,981, Cl. 424-311.000.
Szabolcs, Otto, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Condensation process. 4,467,122, Cl. 568-727.000.
Szijjarto nee Auber, Emilia; and Raskai, Magda, to Human Oltoanyagtermeloo es Kutato Intezet. Composition for the treatment of epithelial injuries and process for the preparation thereof. 4,466,961, Cl. 424-180.000.
Szmuszkovicz, Jacob: *See*—
McMillan, Moses W.; and Szmuszkovicz, Jacob, 4,466,977, Cl. 424-274.000.
T/B & H Home Video: *See*—
Giannis, Peter M.; and Coy, Don R., Jr., 4,466,583, Cl. 242-198.000.
T. D. Williamson, Inc.: *See*—
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Tabler, Charles P.; and Miller, Daniel R., to Buckhorn Material Handling Group Inc.; and Ekco Products, Inc. Molded container with integral hinge. 4,466,541, Cl. 206-506.000.
Tadokoro, Eiichi; Yamamoto, Isao; and Tanaka, Keiji, to Fuji Photo Film Co., Ltd. Supercalendering apparatus. 4,466,164, Cl. 29-132.000.
Tahara, Kazuo; Matsui, Takayuki; Sasamoto, Hisaya; Koharagi, Haruo; Takahashi, Noriyoshi; and Takemura, Akira, to Hitachi, Ltd. Armature of rotating machine with means to balance the mutual inductance of adjacent pairs of coils. 4,467,234, Cl. 310-195.000.
Tahara, Susumu; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Mizutare, Katsuhiko, to Ube Industries, Ltd. Process for continuous preparation of diester of oxalic acid. 4,467,109, Cl. 560-193.000.
Takada, Juichiro. Seat belt anchor assembly. 4,466,666, Cl. 297-483.000.
Takahashi, Akira: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,467,377, Cl. 360-96.100.
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Takahashi, Kenji: *See*—
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Takahashi, Kotei, to Nissan Motor Company, Limited. Speedometer drive gear arrangement in transaxle. 4,466,300, Cl. 74-12.000.
Takahashi, Magoichi: *See*—
Nishigaki, Kenichi; Takahashi, Magoichi; and Wakashima, Keiichi, 4,466,829, Cl. 75-240.000.
Takahashi, Noriyoshi: *See*—
Tahara, Kazuo; Matsui, Takayuki; Sasamoto, Hisaya; Koharagi, Haruo; Takahashi, Noriyoshi; and Takemura, Akira, 4,467,234, Cl. 310-195.000.
Takahashi, Susumu: *See*—
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, 4,467,361, Cl. 358-213.000.
Takahashi, Tetsuo: *See*—
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Takahashi, Toshiya; and Sato, Yoshikusi, to Nippon Electric Co., Ltd. Information transferring apparatus. 4,467,447, Cl. 364-900.000.
Takaishi, Tetsuo; Itabashi, Keiji; Morishita, Satoru; and Hatotani, Hisashi, to Toyo Soda Manufacturing Co., Ltd. Zeolite encapsulating material. 4,466,812, Cl. 55-68.000.
Takano, Kenji: *See*—
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Takase, Hitoshi: *See*—
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Takauji, Kiyomi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Tone synthesizing system for electronic musical instrument. 4,466,325, Cl. 84-1.220.
Takayama, Katsuki: *See*—
Hida, Takashi; Takayama, Katsuki; and Kuwana, Kazutaka, 4,467,426, Cl. 364-424.000.
Takayanagi, Hiroshi: *See*—
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Takeda, Hiroaki: *See*—
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Takeda, Hitoshi; Suzuki, Hidetaka; Kamijo, Ken; and Nagashima, Hideyuki, to Nissan Motor Company, Limited. Automatic seat positioning device for a vehicle driver seat. 4,467,252, Cl. 318-603.000.
Takei, Toshihiro: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; Takei, Toshihiro; Hayakawa, Hideyuki; and Goshima, Takahiro, 4,466,521, Cl. 192-0.032.
Takemura, Akira: *See*—
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Takeshita, Hiroshi; Chuwman, Tsutomu; and Yamamoto, Susumu, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic brake pressure control system of vehicle load responsive type. 4,466,673, Cl. 303-22.00R.
Takeuchi, Toyoshi: *See*—
Murakami, Yoshihiro; Takeuchi, Toyoshi; Ishii, Isao; Murakami, Tadaki; and Takayanagi, Hiroshi, 4,466,793, Cl. 432-253.000.
Takimoto, Masatami: *See*—
Motosugi, Katsuhiko; Takimoto, Masatami; and Koga, Ituo, 4,466,394, Cl. 123-188.00M.
Takishima, Shoji, to Clarion Co., Ltd. Method for mounting conjoined devices. 4,466,181, Cl. 29-589.000.
Takita, Naka: *See*—
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Tamagawa, Akira: *See*—
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Tamai, Yasukatsu; Okabe, Taijiro; and Tomita, Akira, to Toyo Engineering Corporation. Process for smelting nickel. 4,466,828, Cl. 75-82.000.
Tamura, Kimimaro: *See*—
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Tanaami, Yoshiaki: *See*—
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Tanaka, Hirokazu: *See*—
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Tanaka, Kano; and Takeda, Hiroaki, to Canon Kabushiki Kaisha. Light quantity controller and input device. 4,467,246, Cl. 315-158.000.
Tanaka, Kazuo: *See*—
Ikemori, Keiji; and Tanaka, Kazuo, 4,466,707, Cl. 350-422.000.
Tanaka, Keiji: *See*—
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Tanaka, Seiji: *See*—
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Tanaka, Sumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Address selection device. 4,467,225, Cl. 307-296.00A.
Tanaka, Susumu, to Kabushiki Kaisha Suwa Seikosha. Lens holding structure and wire material. 4,466,713, Cl. 351-106.000.
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, to Teijin Limited. Thiaprostaglandin E_1 derivatives, process for production thereof, and pharmaceutical use thereof. 4,466,980, Cl. 424-305.000.
Tang, Raymond: *See*—
Ajioka, James S.; and Tang, Raymond, 4,467,292, Cl. 333-24.100.
Taniguchi, Akira: *See*—
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Tanny, Gerald B., to Gelman Sciences Inc. Method for manufacturing microporous membrane. 4,466,931, Cl. 264-22.000.
Tarancon, Gregorio, to Union Carbide Corporation. Surface treatment of a solid polymeric material with a reactive gas. 4,467,075, Cl. 525-356.000.
Tardani, Massimo: *See*—
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Tarumi, Noriyoshi: *See*—
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Taylor, Earnest E.: *See*—
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Taylor, Howard P. J., to Pandrol Limited. Anchoring a railway rail-fastening clip to a foundation for a railway rail. 4,466,569, Cl. 238-1.000.
Taylor, Jefferson C., Jr., to Exxon Production Research Co. Method and apparatus for preventing vertical movement of subsea downhole tool string. 4,466,487, Cl. 166-339.000.
Taylor, John A.; and Conyne, Richard F., to Extracorporeal Medical Specialties, Inc. Method and apparatus for the irradiation of fluids. 4,467,206, Cl. 250-435.000.
Taylor, Richard J.; and Kellar, Paul R. N., to Micro Consultants Limited. Storage and retrieval of digital data on video tape recorders. 4,467,373, Cl. 360-38.100.
TDK Electronics Co., Ltd.: *See*—
Shiba, Haruo, 4,466,582, Cl. 242-197.000.
Teca-Print AG.: *See*—
Buhrer, Rudolf, 4,466,348, Cl. 101-163.000.
Technar Incorporated: *See*—
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Technicare Corporation: *See*—
Rudolph, Dale C.; and Ray, Michael D., 4,467,273, Cl. 324-65.00R.
Teijin Limited: *See*—
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Telecommunication Radioelectriques et Telephoniques: *See*—
Lassaux, Jean, 4,467,146, Cl. 179-170.200.
Telectronics Pty. Ltd.: *See*—
Money, David K.; and MacLaurin, Andrew D., 4,466,440, Cl. 128-419.0PG.
Telefonaktiebolaget L M Ericsson: *See*—
Charas, Philip M.; Gustavsson, Per-Olof G.; and Morwing, Bo A., 4,467,326, Cl. 343-6.50R.
Telenkov, Vyacheslav V.: *See*—
Dshkhunian, Valery L.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,467,413, Cl. 364-200.000.
Temple, Victor A. K., to General Electric Company. Process for manufacturing insulated-gate semiconductor devices with integral shorts. 4,466,176, Cl. 29-571.000.
Temporal Dynamics Research, Inc.: *See*—
Ritter, David, 4,466,505, Cl. 181-144.000.
Tench, James G., Jr., to International Business Machines Corporation. Graphic data compression. 4,467,363, Cl. 358-261.000.
Tenjinbayashi, Koji: *See*—
Matsuda, Kiyofumi; Tenjinbayashi, Koji; and Kohno, Tsuguo, 4,466,693, Cl. 350-3.600.
Tennant Company: *See*—
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Tereschenko, Gennady F.: *See*—
Zhuk, David S.; Keppen, Vera A.; Sivov, Nikolai A.; Tereschenko, Gennady F.; Golubkov, Igor M.; and Timofeev, Valery E., 4,467,115, Cl. 564-512.000.
Tervamaki, Jukka; Kaski, Erkki; Fagerstedt, Mikael; and Kukka, Aarre, to Labsystems Oy. Thermal expansion resistant pipette. 4,466,298, Cl. 73-864.180.
Tesch A.G.: *See*—
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Tesch, Bernhard, to Tesch A.G., / rgen; and Zwyro A.G. Extensible link band. 4,466,238, Cl. 59-82.000.
Teutenberg, Josef: *See*—
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Texaco Inc.: *See*—
Currie, William S., 4,467,459, Cl. 367-21.000.
Darden, Jerome W., 4,466,896, Cl. 252-78.300.
Dille, Roger M.; Richter, George N.; Estabrook, Lawrence E.; Rohner, Jean-Georges P.; and Rhodes, Harold A., 4,466,810, Cl. 48-197.00R.
MacLean, John P., 4,466,479, Cl. 165-1.000.
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Walker, Clarence O., 4,466,486, Cl. 166-301.000.
Texas Instruments Incorporated: *See*—
Chiu, Te-Long; and Lien, Jih-Chang, 4,467,453, Cl. 365-185.000.
Darley, Henry M.; and Houston, Theodore W., 4,466,174, Cl. 29-571.000.
Dittakavi, Ashok; and Olson, Albert J., 4,466,801, Cl. 434-335.000.
Grant, John L.; Torti, Emanuel D.; O'Malley, Austin S.; Galligan, Thomas W.; and DelPrete, Stephen D., 4,466,684, Cl. 339-176.00M.
Kuo, Chang-Kiang, 4,467,450, Cl. 365-149.000.
Orcutt, John W., 4,466,460, Cl. 137-625.200.
Textron Inc.: *See*—
Giandenoto, Frank J.; and Saiia, Anthony J., 4,466,504, Cl. 180-273.000.
Thal, Herbert L., Jr., to General Electric Company. Loaded waveguide lenses. 4,467,329, Cl. 343-753.000.
Tharrat, John; and Harlock, Sally-Jane, to Smith and Nephew Associated Companies Limited. Dressings, manufacture and use. 4,466,431, Cl. 128-156.000.
Thermocell Development, Ltd.: *See*—
Smith, Stuart B., 4,467,014, Cl. 428-314.400.
Thesman, Dana F., to Thesman Industries, Inc. Mower drive assembly. 4,466,233, Cl. 56-11.300.
Thesman Industries, Inc.: *See*—
Thesman, Dana F., 4,466,233, Cl. 56-11.300.
Thiel, Peter H.; Mercier, George E.; and Pruett, Michael D., to Westinghouse Electric Corp. Multi-section power capacitor with all-film dielectric. 4,467,397, Cl. 361-328.000.
Thijssen, Johannes M.: *See*—
Berbee, Hubertus J.; Voute, Hendrik J.; and Thijssen, Johannes M., 4,466,286, Cl. 73-629.000.
Thiokol Corporation: *See*—
Guziec, Frank S., Jr., 4,466,921, Cl. 260-397.300.
Thoe, James H., to Hitachi Metals International Ltd. Electromagnetic chuck power supply and controller. 4,467,388, Cl. 361-145.000.
Thoma, Peter: *See*—
Habermann, Wolfgang; Hammes, Peter; Felger, Joachim; Hock, Karl-Ludwig; Brunnmueller, Friedrich; Knittel, Helmut; Kranz, Joachim; Schneider, Rolf; and Thoma, Peter, 4,466,867, Cl. 204-91.000.
Thomas, Charles H. Stand for a hand held hair dryer. 4,466,203, Cl. 34-99.000.
Thomas, David H.: *See*—
Jonathan, Paget; and Thomas, David H., 4,467,137, Cl. 174-87.000.
Thomas, Royston, to ICI Americas Inc. Phenolic antioxidant. 4,467,119, Cl. 568-724.000.
Thomasson, James T., to Newport Corporation. Electric motor controls for mechanical actuators. 4,467,250, Cl. 318-436.000.
Thompson, Bryan: *See*—
Ho, Nelson; Thompson, Bryan; and Kratochvil, Jiri, 4,466,879, Cl. 204-415.000.
Thompson, Francis P.: *See*—
Bottom, James T.; Arnold, James J.; and Thompson, Francis P., 4,466,136, Cl. 2-115.000.
Thompson, Isaac J. Automatic adjusting nutcracker. 4,466,343, Cl. 99-572.000.
Thompson Medical Co., Inc.: *See*—
Silverman, Harold I.; and Steinberg, Edward L., 4,466,960, Cl. 424-166.000.
Thompson, Ronald L.: *See*—
Gardner, Robert M.; and Thompson, Ronald L., 4,466,266, Cl. 72-357.000.
Thomson, Morton W., to Parker Manufacturing Company. Hacksaw with improved blade-tensioning mechanism. 4,466,471, Cl. 145-33.00A.
Thone, Ernst. Arrangement for measuring viscosity. 4,466,275, Cl. 73-57.000.
Thorley, Graham R.; and Sullivan, Donald B. Wheelchair lift. 4,466,771, Cl. 414-787.000.
Thrandorf, Hans-Peter; and Kratzsch, Achim, to VEB Kombinat Polygraph "Werner Lamberz". Separation unit for processed book blocks. 4,466,529, Cl. 198-368.000.
Tilker, Fred C.: *See*—
Nayler, Douglas W. J.; Gilson, Gerald W.; Tilker, Fred C.; and Albert, James W., 4,466,488, Cl. 166-355.000.
Timofeev, Valery E.: *See*—
Zhuk, David S.; Keppen, Vera A.; Sivov, Nikolai A.; Tereschenko, Gennady F.; Golubkov, Igor M.; and Timofeev, Valery E., 4,467,115, Cl. 564-512.000.
Timoshenko, John A.: *See*—
Bergh, Daniel D.; Koch, Robert E.; and Timoshenko, John A., 4,467,387, Cl. 361-132.000.
Tinsley, John M.: *See*—
Chatterji, Jiten; Brake, Bobby G.; and Tinsley, John M., 4,466,837, Cl. 106-85.000.
Tischer, Werner: *See*—
Liebert, Karl-Heinz; Fassbender, Rolf; and Tischer, Werner, 4,466,243, Cl. 60-384.000.
Tobin, Leo W., Jr. Angle measuring device. 4,466,189, Cl. 33-267.000.
Toda, Fumio; and Tanaka, Koichi, to Ube Industries, Ltd. Optically active propargyl alcohol derivative and a method for preparation of the same. 4,467,102, Cl. 549-78.000.
Toda, Junichi, to Shimano Industrial Company Limited. Fishing reel. 4,466,580, Cl. 242-84.21R.
Toda, Tadayoshi: *See*—
Baba, Shigeyuki; and Toda, Tadayoshi, 4,466,655, Cl. 296-214.000.
Todo, Yoshinori: *See*—
Imanari, Makoto; Oshida, Bunzi; Arima, Yusaku; Tanaka, Hirokazu; Todo, Yoshinori; Kobayashi, Norihisa; and Sera, Toshikuni, 4,466,947, Cl. 423-239.000.
Tojo, Toru: *See*—
Sugihara, Kazuyoshi; Tojo, Toru; Mori, Ichiro; and Shinozaki, Toshiaki, 4,467,210, Cl. 250-492.200.
Tokai Seiki Co., Ltd.: *See*—
Nitta, Tomio, 4,466,788, Cl. 431-255.000.
Tokiwa, Kyoichi: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.
Tokunaga, Hiroshi: *See*—
Seimiya, Ryubun; Inowa, Shigeru; Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,467,333, Cl. 346-154.000.
Tokuno, Masateru; and Sawada, Tetsuya, to Rengo Co., Ltd. Rotary die cutter. 4,466,320, Cl. 83-325.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iwahashi, Hiroshi; and Asano, Masamichi, 4,467,457, Cl. 365-228.000.
Iwata, Yasuhiro, 4,466,729, Cl. 355-3.0CH.
Kobayashi, Akio; Ozaki, Yasuo; and Rikitake, Sunao, 4,467,158, Cl. 200-148.00A.
Komatsu, Shigeru, 4,467,312, Cl. 338-309.000.
Miyazima, Kenzi, 4,466,565, Cl. 228-1.00B.
Nagasawa, Shigeru, 4,467,226, Cl. 307-315.000.
Nishimura, Fuminobu, 4,466,379, Cl. 118-658.000.
Ogita, Tadahisa, 4,467,229, Cl. 310-60.00A.
Saito, Shozo; Uchida, Yukimasa; Hashimoto, Kazuhiko; and Endo, Norio, 4,467,452, Cl. 365-184.000.
Sugihara, Kazuyoshi; Tojo, Toru; Mori, Ichiro; and Shinozaki, Toshiaki, 4,467,210, Cl. 250-492.200.
Suzuki, Nobuo, 4,467,341, Cl. 357-24.000.
Suzuki, Nobuo, 4,467,341, Cl. 357-24.000.
Tanaka, Sumio, 4,467,225, Cl. 307-296.00A.
Tsutsumi, Teruo; and Takahashi, Tetsuo, 4,467,331, Cl. 346-22.000.
Tolle, Laura L.: *See*—
Kolycheck, Edmond G.; and Tolle, Laura L., 4,467,078, Cl. 525-455.000.

Tollefsen, Gerald E.: *See*—
Eickemeyer, Daniel B.; Rausch, Maurice K.; and Tollefsen, Gerald E., 4,466,883, Cl. 208-50.000.
Tolliver, Wilbur E. Stackable stirrup mat. 4,466,467, Cl. 138-175.000.
Tolok, Vladimir T.: *See*—
Andreev, Anatoly A.; Gavrilov, Alexei G.; Galitskaya, Galina K.; Zhed, Viktor P.; Sinelschikov, Andrei K.; Padalka, Valentin G.; and Tolok, Vladimir T., 4,466,991, Cl. 427-38.000.
Tomaszewski, Thaddeus W.; Tremmel, Robert A.; and Rudolph, Larry T., to OMI International Corporation. Trivalent chromium electroplating process. 4,466,865, Cl. 204-51.000.
Tomforde, Johann: *See*—
Bauer, Karlheinz; Langenbeck, Andreas; Pfeiffer, Peter; and Tomforde, Johann, 4,467,402, Cl. 362-32.000.
Tomita, Akira: *See*—
Tamai, Yasukatsu; Okabe, Taijiro; and Tomita, Akira, 4,466,828, Cl. 75-82.000.
Tomm, Irwin: *See*—
Moss, Theron C.; Boring, Earl; and Tomm, Irwin, 4,466,152, Cl. 15-229.00A.
Tomozawa, Atsushi: *See*—
Maruta, Rikio; and Tomozawa, Atsushi, 4,467,315, Cl. 340-347.0DD.
Tomy Kogyo Co., Inc.: *See*—
Ozawa, Shoji, 4,466,649, Cl. 294-19.00R.
Tonchen, Stephen. Prefabrication method and preformed band for use in coupling tubular members. 4,466,642, Cl. 285-419.000.
Tonen Sekiyu Kagaku Kabushiki Kaisha: *See*—
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, 4,467,061, Cl. 524-87.000.
Toray Industries, Inc.: *See*—
Iwayama, Kazuyoshi; Ebitani, Atsushi; Inoue, Takehisa; and Kani, Atsuo, 4,467,129, Cl. 585-481.000.
Mori, Yukiyoshi, 4,466,949, Cl. 423-447.400.
Torii, Hideo; Okinaka, Hideyuki; and Ozawa, Toshio, to Matsushita Electric Industrial Co., Ltd. Oxygen sensor. 4,466,880, Cl. 204-428.000.
Torti, Emanuel D.: *See*—
Grant, John L.; Torti, Emanuel D.; O'Malley, Austin S.; Galligan, Thomas W.; and DelPrete, Stephen D., 4,466,684, Cl. 339-176.00M.
Toru, Takeshi: *See*—
Tanaka, Toshio; Toru, Takeshi; Oba, Takeo; Okamura, Noriaki; Watanabe, Kenzo; Bannai, Kiyoshi; Hazato, Atsuo; Kurozumi, Seizi; Kamimoto, Fukuyoshi; and Ohtsu, Akira, 4,466,980, Cl. 424-305.000.
Tosaka, Yoichi: *See*—
Haraguchi, Shosuke; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Tosaka, Yoichi, 4,466,719, Cl. 354-173.110.
Toshiba Silicone Co., Ltd.: *See*—
Maruyama, Kazo; and Kurita, Akitsugu, 4,467,068, Cl. 524-731.000.
Toth, Emery K.; and Egbert, Lawrence E. Microwave oven leak detector. 4,467,278, Cl. 324-95.000.
Tower, Douglass G. Apparatus for removing rocks and objects. 4,466,491, Cl. 172-459.000.
Tower, John R., to RCA Corporation. Multi-chip imager. 4,467,342, Cl. 357-30.000.
Towersey, Peter J.; Longton, John; and Cockram, Geoffrey N., to Ranks Hovis McDougall Limited. Edible protein containing substances. 4,466,988, Cl. 426-656.000.
Townsend, Douglas W.: *See*—
Boxall, Larry G.; and Townsend, Douglas W., 4,466,995, Cl. 422-113.000.
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,466,996, Cl. 427-122.000.
Townsend, Montie M. Carrier apparatus. 4,466,652, Cl. 294-142.000.
Toyo Engineering Corporation: *See*—
Tamai, Yasukatsu; Okabe, Taijiro; and Tomita, Akira, 4,466,828, Cl. 75-82.000.
Toyo Kogyo Co., Ltd.: *See*—
Harasaki, Hayathugu, 4,466,653, Cl. 296-189.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Takaishi, Tetsuo; Itabashi, Keiji; Morishita, Satoru; and Hatotani, Hisashi, 4,466,812, Cl. 55-68.000.
Toyoda Gosei Co., Ltd.: *See*—
Ito, Hiroshi; Kuno, Hiroshi; and Kai, Tooru, 4,467,214, Cl. 250-563.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Furuta, Youichi; Tsubouchi, Kaoru; Nishii, Michiharu; Sugiura, Yuzuru; and Tsuchida, Shozaburo, 4,466,246, Cl. 60-547.100.
Katayma, Nobuaki, 4,466,306, Cl. 74-477.000.
Nakanishi, Kiyoshi; Okumura, Takeshi; and Inoue, Tokuta, 4,466,398, Cl. 123-188.00M.
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,466,392, Cl. 123-179.00G.
Ueno, Makoto; and Hori, Kohei, 4,466,404, Cl. 123-198.00F.
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, 4,467,061, Cl. 524-87.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,466,405, Cl. 123-416.000.
Kato, Shinichi; Dohi, Yoshihiko; Motosugi, Katsuhiko; and Koga, Ituo, 4,466,395, Cl. 123-188.00M.
Kato, Shinichi; Motosugi, Katsuhiko; Isogai, Kiyoshi; Koga, Ituo; and Takita, Naka, 4,466,397, Cl. 123-188.00M.
Kondo, Kouichi; Ueda, Masahiro; and Nonoyama, Seiji, 4,466,625, Cl. 280-6.00R.
Motosugi, Katsuhiko; Takimoto, Masatami; and Koga, Ituo, 4,466,394, Cl. 123-188.00M.
Nakanishi, Kiyoshi; and Koga, Ituo, 4,466,396, Cl. 123-188.00M.
Oishi, Yaichi; Maruyama, Katsuaki; Takano, Kenji; Terada, Takami; and Hyodo, Motoi, 4,466,663, Cl. 297-410.000.
Oonishi, Akito; and Watanabe, Haruo, 4,466,413, Cl. 123-493.000.
Takeshita, Hiroshi; Chuwman, Tsutomu; and Yamamoto, Susumu, 4,466,673, Cl. 303-22.00R.
Yoshimura, Junjiro; Yamada, Kenji; and Obata, Haruyuki, 4,466,414, Cl. 123-564.000.
Yoshino, Yasuhisa; Kodera, Masao; Ito, Hajime; and Ohta, Hisatoshi, 4,467,313, Cl. 340-904.000.
Traeder, Howard F.: *See*—
Mross, James J.; Traeder, Howard F.; and Seidl, Robert M., 4,466,299, Cl. 74-5.700.
Trahanovsky, Walter S.: *See*—
Carlson, Gene D.; and Trahanovsky, Walter S., 4,467,337, Cl. 346-209.000.
Tremmel, Robert A.: *See*—
Tomaszewski, Thaddeus W.; Tremmel, Robert A.; and Rudolph, Larry T., 4,466,865, Cl. 204-51.000.
Trend, John E.: *See*—
Eian, Gilbert L.; and Trend, John E., 4,467,022, Cl. 430-17.000.
Treves, Gino R.; and Baum, Burton M., to FMC Corporation. Anticholinergic compounds. 4,467,095, Cl. 546-342.000.
Tri Tool, Inc.: *See*—
Astle, William H., 4,466,193, Cl. 33-21.00R.
Trisa Burstenfabrik AG: *See*—
Jurt, Alfred, 4,466,150, Cl. 15-143.00R.
Tronchon, Christian, to S.A. Radiall. Coaxial connector element. 4,466,685, Cl. 339-177.00R.
Troost, Marcel A., to Siemens Aktiengesellschaft. Circuit arrangement for time-division multiplex telecommunication switching systems for multi-channel connections. 4,467,471, Cl. 370-68.000.
Trotter, Richard H.: *See*—
Kaltz, Milton C.; and Trotter, Richard H., 4,466,657, Cl. 296-221.000.
TRW Inc.: *See*—
Wesson, Laurence N., 4,466,295, Cl. 73-862.380.
Tryhorn, Donald W., to Sir W. G. Armstrong Whitworth & Company, Ltd. Compression ignition internal combustion engine. 4,466,388, Cl. 123-51.0BB.
Tsang, Wen-Ghih; and Slaugh, Lynn H., to Shell Oil Company. Zeolite-ruthenium-borane catalyst composition. 4,466,907, Cl. 502-74.000.
Tsen, Cho C.; and Adams, Karl B., to Kansas State University Research Foundation. Method for preparing canned, retorted pasta products. 4,466,985, Cl. 426-131.000.
Tsubouchi, Kaoru: *See*—
Furuta, Youichi; Tsubouchi, Kaoru; Nishii, Michiharu; Sugiura, Yuzuru; and Tsuchida, Shozaburo, 4,466,246, Cl. 60-547.100.
Tsuchida, Shozaburo: *See*—
Furuta, Youichi; Tsubouchi, Kaoru; Nishii, Michiharu; Sugiura, Yuzuru; and Tsuchida, Shozaburo, 4,466,246, Cl. 60-547.100.
Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Framing tube and framing camera. 4,467,189, Cl. 250-213.0VT.
Tsuda, Takao: *See*—
Kishimoto, Tadao; and Tsuda, Takao, 4,466,604, Cl. 271-111.000.
Tsunekawa, Tokuichi; and Amikura, Takashi, to Canon Kabushiki Kaisha. Automatic focusing device which inhibits focusing when a low contrast scene is sensed. 4,467,187, Cl. 250-204.000.
Tsuruoka, Takashi; Imai, Satoshi; Satoh, Atsuyuki; Watanabe, Tetsuro; Watanabe, Koji; Inouye, Shigeharu; and Niida, Taro, to Maiji Seika Kaisha Ltd. Phosphorus-containing compounds and process for producing the same. 4,466,913, Cl. 260-112.50R.
Tsuruta, Shichiro; and Sakoe, Hiroaki, to Nippon Electric Co., Ltd. Pattern matching device with a DP technique applied to feature vectors of two information compressed patterns. 4,467,437, Cl. 364-513.500.
Tsutsumi, Teruo; and Takahashi, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Recording apparatus. 4,467,331, Cl. 346-22.000.
Tu Xuan, Mai, to Societe Suisse Pour L'Industrie Horlogere Management Services S.A. Position detector for a stepping motor. 4,467,255, Cl. 318-696.000.
Turek, Edward A.: *See*—
Goddin, Clifton S., Jr.; Turek, Edward A.; and George, Boyd A., 4,466,946, Cl. 423-228.000.
Turner, Ruth L.: *See*—
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Tuttle Aluminum & Bronze, Inc.: *See*—
Tuttle, John T., 4,466,600, Cl. 256-65.000.
Tuttle, John T., to Tuttle Aluminum & Bronze, Inc. Round pipe rail system. 4,466,600, Cl. 256-65.000.
Twin City International Inc.: *See*—
Joffe, Boris B.; Spongr, Jerry J.; and Ivasyuk, Boris N., 4,467,198, Cl. 250-308.000.
Ube Industries, Ltd.: *See*—
Tahara, Susumu; Fujii, Kozo; Nishihira, Keigo; Matsuda, Masaoki; and Mizutare, Katsuhiko, 4,467,109, Cl. 560-193.000.
Toda, Fumio; and Tanaka, Koichi, 4,467,102, Cl. 549-78.000.

Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, to Toyota Jidosha Kabushiki Kaisha. Automatic engine stop-restart system. 4,466,392, Cl. 123-179.00G.
Uchida, Yukimasa: *See*—
Saito, Shozo; Uchida, Yukimasa; Hashimoto, Kazuhiko; and Endo, Norio, 4,467,452, Cl. 365-184.000.
Uchidoi, Masanori: *See*—
Haraguchi, Shosuke; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Tosaka, Yoichi, 4,466,719, Cl. 354-173.110.
Uchikoshi, Gohji, to Nakamichi Corporation. Signal conversion circuit. 4,467,319, Cl. 340-347.0DA.
Uchiyama, Kaoru: *See*—
Kobayashi, Kazuhiko; Kito, Eiichi; Watase, Nobuo; and Uchiyama, Kaoru, 4,466,316, Cl. 83-13.000.
Ueda, Masahiro: *See*—
Kondo, Kouichi; Ueda, Masahiro; and Nonoyama, Seiji, 4,466,625, Cl. 280-6.00R.
Ueda, Toshitaka: *See*—
Yoshii, Tsuneo; and Ueda, Toshitaka, 4,467,049, Cl. 502-317.000.
Uehara, Kenichiro; and Nasu, Yoshihiro, to Sumitomo Electric Industries, Ltd. System for measuring the length of a long magnetizable material. 4,467,280, Cl. 324-206.000.
Uehlinger, Hanspeter, to Sandoz Ltd. Disazo compounds having a further unsubstituted or substituted sulfophenyl diazo component radical and a 4-alkoxy- or arylsulfonyloxy benzene coupling component radical having an acylamina substituent. 4,466,920, Cl. 260-187.000.
Ueno, Haruyuki: *See*—
Hatta, Tokuaki; Ueno, Haruyuki; Katsura, Yuji; Fukuda, Kazushige; Kubota, Hiroshi; and Hamamatu, Takashi, 4,467,042, Cl. 501-88.000.
Ueno, Makoto; and Hori, Kohei, to Toyota Jidosha Kabushiki Kaisha. Split engine. 4,466,404, Cl. 123-198.00F.
Ueta, Yutaka: *See*—
Oka, Masahiko; Kano, Hideo; and Ueta, Yutaka, 4,467,074, Cl. 525-356.000.
UHDE GmbH: *See*—
Herbort, Hans-Joachim; and Schuster, Heinz G., 4,466,814, Cl. 55-90.000.
Ullrich, Helmut: *See*—
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Ulrich, Bodo: *See*—
Lamatsch, Hans; Schmidt, Helmut; Ulrich, Bodo; and Braungardt, Karl-Heinz, 4,466,182, Cl. 29-596.000.
Ulrich, Henry D.: *See*—
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Umekawa, Osamu: *See*—
Magami, Masato; Sato, Toshio; Katayama, Sakae; and Umekawa, Osamu, 4,466,975, Cl. 424-270.000.
Umemoto, Masuo: *See*—
Ozawa, Naoki; Nagahara, Shusaku; Takahashi, Kenji; Umemoto, Masuo; Sato, Kazuhiro; Izumita, Morishi; Akiyama, Toshiyuki; Sato, Masanori; and Kudo, Koji, 4,467,347, Cl. 358-44.000.
Umemoto, Yoshiro: *See*—
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Unifilter di D. Panetta: *See*—
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Frey, Paul H., 4,466,465, Cl. 138-118.100.
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Kupcikevicius, Vytautas; and Raudys, Vytas A., 4,466,464, Cl. 138-118.100.
Kupcikevicius, Vytautas, 4,466,984, Cl. 426-105.000.
Raudys, Vytas A., 4,466,466, Cl. 138-118.100.
Tarancon, Gregorio, 4,467,075, Cl. 525-356.000.
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Salam, Hassan P. A., 4,466,207, Cl. 40-449.000.
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Agriculture: *See*—
Friedrich, John P., 4,466,923, Cl. 260-412.400.
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Davis, Steven J.; and Hanko, Leonard, 4,467,474, Cl. 372-89.000.
Goralnick, Norman S.; and McLellan, George H., Jr., 4,467,186, Cl. 250-201.000.
Kendig, Warren C., 4,467,429, Cl. 364-433.000.
McDonald, Alexander B.; and Mannix, Joseph T., 4,466,662, Cl. 297-406.000.
Army: *See*—
Cheklich, George E., 4,466,408, Cl. 123-425.000.
Grace, Fred I., 4,466,353, Cl. 102-307.000.
Ramer, Jon, 4,467,442, Cl. 364-843.000.
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Garrison, Melton E., 4,466,567, Cl. 228-183.000.
Gordy, Wade T., 4,467,152, Cl. 200-42.00T.
Ramos, Terry J., 4,467,171, Cl. 219-121.0LG.
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Sovey, James S.; Rawlin, Vincent K.; and Roman, Robert F., 4,466,242, Cl. 60-202.000.
Navy: *See*—
Holtrop, John W., 4,466,334, Cl. 91-45.000.
U.S. Philips Corporation: *See*—
Blackburn, Anthony; and Readhead, John B., 4,467,201, Cl. 250-334.000.
Brongersma, Hidde H., 4,466,818, Cl. 65-3.130.
Coe, David J., 4,466,175, Cl. 29-571.000.
Fosse, Robert, 4,467,360, Cl. 358-197.000.
Huisman, Hendrikus F., 4,467,382, Cl. 360-125.000.
Jochems, Pieter J. W., 4,466,171, Cl. 29-571.000.
Kupfer, Karl H., 4,467,393, Cl. 361-278.000.
Needham, Martin J., 4,466,748, Cl. 374-129.000.
Roza, Engel, 4,467,291, Cl. 332-11.00D.
Sollner, Gerhard, 4,466,474, Cl. 160-107.000.
Velo, Henri J., 4,467,192, Cl. 250-214.00A.
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Cycon, James P.; Krauss, Timothy A.; and Roman, Stephan, 4,466,774, Cl. 416-134.00A.
Grantham, Daniel H.; and Swindal, James L., 4,467,394, Cl. 361-283.000.
Miller, Guy W., 4,466,240, Cl. 60-39.310.
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Abrams, Robert M., 4,466,445, Cl. 128-736.000.
University of Missouri, The Curators of the: *See*—
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UOP Inc.: *See*—
House, David W.; and Swedo, Raymond J., 4,466,910, Cl. 252-500.000.
House, David W., 4,466,911, Cl. 252-500.000.
Vora, Bipin V., 4,467,128, Cl. 585-456.000.
Zinnen, Hermann A., 4,467,126, Cl. 568-937.000.
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Urban, Arthur L.: *See*—
Kester, Bruce J.; Urban, Arthur L.; and Kester, Dale C., 4,466,308, Cl. 74-483.00R.
Urbani, William G. Tank cleaning system. 4,466,154, Cl. 15-302.000.
Utsugi, Mikio, to Olympus Optical Co., Ltd. Ultrasonic diagnostic apparatus for examination of a coeliac cavity. 4,466,443, Cl. 128-660.000.
Vahlensieck, Hans-Joachim: *See*—
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Valayil, Silvester P.; and Aronson, Vita, to Shipley Company. Electroless nickel plating. 4,467,067, Cl. 524-435.000.
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Billet, Rene , 4,466,527, Cl. 192-98.000.
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Staempfli, Jackie, 4,466,197, Cl. 33-377.000.
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Van Pool, Joe: *See—*
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Van Sloun, Peter H., to Honeywell Inc. Dispersing mine dispenser. 4,466,332, Cl. 89-1.50R.
Vartiainen, Osmo, to OV-Eng Oy. Process for recovering metal values from alloy scraps. 4,466,826, Cl. 75-63.000.
Vaughn, Thomas D.: *See—*
Ali, Rafath; and Vaughn, Thomas D., 4,467,179, Cl. 219-368.000.
VDO Adolf Schindling AG: *See—*
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VEB Kombinat Polygraph "Werner Lamberz": *See—*
Thrandorf, Hans-Peter; and Kratzsch, Achim, 4,466,529, Cl. 198-368.000.
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Ventre, Augustus: *See—*
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Venuti, Michael C.: *See—*
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Verkaart, Wesley H., to Haemonetics Corporation. Suction liquid collection assembly and flexible collecting bag therefor. 4,466,888, Cl. 210-232.000.
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Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,467,464, Cl. 369-77.200.
Vidal, Paul F.; and Goodrich, Fred N. S., to Radant Systems, Inc. Dielectric structures for radomes. 4,467,330, Cl. 343-872.000.
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Janky, James M.; and Horley, Albert L., 4,467,294, Cl. 333-126.000.
Vitaloni, Alberto, to Vitaloni S.p.A. Rear view mirror for motor-vehicles. 4,466,712, Cl. 350-582.000.
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Voelskow, Hartmut; and Sukatsch, Dieter, to Hoechst Aktiengesellschaft. Process for the production of D-lactic acid with the use of *Lactobacillus bulgaricus* DSM 2129. 4,467,034, Cl. 435-139.000.
Volante, Ralph P.: *See—*
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Volkmann, Jurgen. Ejector device. 4,466,778, Cl. 417-174.000.
Volksen, Willi: *See—*
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Volnak, William M. Chording keyboard for generating binary data. 4,467,321, Cl. 340-365.0VL.
Von Duprin, Inc.: *See—*
Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., 4,466,643, Cl. 292-92.000.
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Von Hoene, Donald C.: *See—*
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Vora, Bipin V., to UOP Inc. Integrated HF regeneration in aromatic hydrocarbon alkylation process. 4,467,128, Cl. 585-456.000.
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Nikolson, Robert C.; Vorbruggen, Helmut; Casals-Stenzel, Jorge; and Mannesmann, Gerda, 4,466,969, Cl. 424-263.000.
Voute, Hendrik J.: *See—*
Berbee, Hubertus J.; Voute, Hendrik J.; and Thijssen, Johannes M., 4,466,286, Cl. 73-629.000.
Vredestein N.W.: *See—*
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Andreev, Anatoly A.; Gavrilov, Alexei G.; Galitskaya, Galina K.; Zhed, Viktor P.; Sinelschikov, Andrei K.; Padalka, Valentin G.; and Tolok, Vladimir T., 4,466,991, Cl. 427-38.000.
W. R. Grace & Co.: *See—*
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Waas, Oskar G., to Siemens Aktiengesellschaft. Circuit arrangement for T.D.M. telecommunication exchange system, comprising T.D.M. lines whose time channels serve partially for message connections and partially for the transmission of signalling information. 4,467,470, Cl. 370-66.000.
Wagenknecht, Conrad D.: *See—*
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Wagner, Ludwig: *See—*
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Wahlco International Inc.: *See—*
Southam, Barry J., 4,466,815, Cl. 55-122.000.
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Wakai, Katsuro, to Hitachi, Ltd. Data processing system with access to a buffer store during data block transfers. 4,467,419, Cl. 364-200.000.
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Walsh, J. William: *See—*
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Walters, Charles W., to Emhart Industries, Inc. Cathode electrode for an electrical device and method of making same. 4,466,841, Cl. 148-6.14R.
Walters, Reiner; Moschl, Gernot; and Allardt, Hans-Dieter, to Merck Patent Gesellschaft mit Beschrankter Haftung. Hairdyeing composition and method. 4,466,805, Cl. 8-406.000.
Wambach, Allen D.: *See—*
Dieck, Ronald L.; and Wambach, Allen D., 4,467,057, Cl. 523-212.000.
Wang, Dee: *See—*
Chambers, Derek; and Wang, Dee, 4,467,268, Cl. 323-222.000.
Wang, Yen. Minimal radiologic imaging method and apparatus. 4,467,351, Cl. 358-111.000.
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Warman, Bloomfield J. Telephone conference amplifiers, and telephone conference bridges incorporating the same. 4,467,143, Cl. 179-18.0BC.
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Cifrese, Ralph; Medri, Mario W.; and Abbazia, Leonard P., 4,466,983, Cl. 426-5.000.
Lowke, George E.; and Meltzer, Robert J., 4,467,032, Cl. 435-34.000.
Warnke, Dale F.; and Cederstrand, Carl N., to Beckman Instruments, Inc. Infrared gas analyzer having detector elements of differing types. 4,467,435, Cl. 364-497.000.
Warnke, Heinrich: *See—*
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Waryasz, Richard E., to Combustion Engineering, Inc. Support for in-bed heat exchanger. 4,466,385, Cl. 122-510.000.
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Wasson, Richard A., to RCA Corporation. Fail-safe sensor circuit. 4,467,386, Cl. 361-106.000.
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Watanabe, Koji; and Yagi, Michio, to Konishiroku Photo Industry Co., Ltd. Variable electronic flash light equipment. 4,467,248, Cl. 315-241.00P.
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Watson, James M.; Butler, James R.; and Mikkelson, Karen A., to Cosden Technology, Inc. Polymerization co-inhibitors for vinyl aromatic compounds. 4,466,904, Cl. 252-402.000.

Watson, James M.: *See*—
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Weaver, Gabriel H.: *See*—
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Webb, Frederick A.: *See*—
Sweeney, William T.; Shaw, Rick L.; and Webb, Frederick A., 4,466,759, Cl. 406-15.000.

Weber, Edwin, to Kautt & Bux KG. Unit plug. 4,467,398, Cl. 361-331.000.

Weber, Franz K., to Modulite Corporation. Spring clip bracket. 4,467,405, Cl. 362-352.000.

Weber, Roy; and Huddleston, Bruce C. Disc stabilized flame afterburner. 4,466,359, Cl. 110-213.000.

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Weikel, Scott J.; York, Theodore H., Jr.; and Yates, Carl E., to Westinghouse Electric Corp. Electric utility communication system with field installation terminal and load management terminal with remotely assignable unique address. 4,467,314, Cl. 340-310.00A.

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Weitz, Hans-Martin; and Fischer, Rolf, to BASF Aktiengesellschaft. Preparation of 3-alkyl-3-acyloxy-4-hydroxybut-1-enes. 4,466,922, Cl. 260-410.90R.

Weitz, Hans-Martin: *See*—
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Weldon, Clark P.: *See*—
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Wendt, Peter, to Siemens Aktiengesellschaft. Diplexer for the separation of a signal and of a supply current. 4,467,472, Cl. 370-97.000.

Wenner, Bernard J.: *See*—
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Wessel, Otto, to Mannesmann A.G. Compound tool for hot-working. 4,466,265, Cl. 72-97.000.

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Johnston, Roy G. S.; and Pavelin, Dennis F., 4,466,937, Cl. 264-256.000.

Wesson, Laurence N., to TRW Inc. Photoelastic sensing means. 4,466,295, Cl. 73-862.380.

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West Electric Company, Ltd.: *See*—
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White, Alan C.: *See*—
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White, Barry B., to Storage Technology Corporation. Virtual storage system and method. 4,467,421, Cl. 364-200.000.

White, David D., Jr.: *See*—
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White, David R.; and Maring, Clarence J., to Upjohn Company, The. Processes for the preparation of spectinomycin analogs, products and intermediates therein. 4,467,103, Cl. 549-361.000.

White, Timothy T.: *See*—
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Whiteley, Helen R.: *See*—
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Whitfield, Fred J.; and Doyel, Arthur T. Methods and means for conducting heat from electronic components and the like. 4,466,483, Cl. 165-185.000.

Wide-Lite International Corporation: *See*—
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Wiener-Avnear, Eliezer; and Grinberg, Jan, to Hughes Aircraft Company. Liquid crystal light valve with birefringence compensation. 4,466,702, Cl. 350-347.00R.

Wilbur, Leonard P., Jr.; and Wardell, Myron H., Jr., to RCA Corporation. Color selection electrode mounting structure having an off-set washer. 4,467,242, Cl. 313-406.000.

Wilkerson, Timothy M.; and Learned, Edward B., to AMF Incorporated. Telephone annuciator extender. 4,467,144, Cl. 179-84.00R.

Wilkins, Howard; and Gannis, Peter M., to Nabisco Brands, Inc. Process for preparing low-fat nuts. 4,466,987, Cl. 426-632.000.

Wilkinson, Richard L.; and Vitale, George, to Discovision Associates. Video recorder-playback machine. 4,467,467, Cl. 369-111.000.

Willcox, Frederick P. Carriage guiding system and frame for a printer. 4,466,753, Cl. 400-354.000.

William R. Selwood Limited: *See*—
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Williams, Joel; Dunn, Terry; and Stannett, Vivian, to Becton Dickinson and Company. Semi-crystalline polymers stabilized for irradiation sterilization. 4,467,065, Cl. 524-296.000.

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Witt, Richard W.: *See*—
Broome, J. Wesley; and Witt, Richard W., 4,466,336, Cl. 91-420.000.

Witt, William F., to Ampex Corporation. Loading apparatus for differential band brake. 4,466,512, Cl. 188-171.000.
Wium, Eigil, to General Signal Corporation. Drainable enclosure for explosion-proof electrical systems. 4,467,136, Cl. 174-50.000.
Wohlwend, Maurice, to HED Corporation. Reciprocating linear fluid motor. 4,466,493, Cl. 173-19.000.
Wojnarowski, Robert J.: *See*—
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,466,850, Cl. 156-276.000.
Wolfe-Gerate GmbH: *See*—
Kolb, Walter; and Weid, Helmut, 4,466,377, Cl. 16-114.00R.
Wolfson, Stephen L.: *See*—
Bushman, James B.; Weldon, Clark P.; and Wolfson, Stephen L., 4,467,274, Cl. 324-71.100.
Woodruff, James L. Laser alignment system for vehicles. 4,466,196, Cl. 33-288.000.
Woods, William E.; Cushing, David E.; Lemay, Richard A.; and Stanley, Philip E., to Honeywell Information Systems Inc. Flexible logic transfer and instruction decoding system. 4,467,417, Cl. 364-200.000.
Woods, William E.: *See*—
Cushing, David E.; Lemay, Richard A.; Stanley, Philip E.; and Woods, William E., 4,467,416, Cl. 364-200.000.
Wooten, Ronald E.; Lehne, John; and Kwan, Gerald A., to LeVan Specialty Co., Inc. Multi-positioning latch assembly. 4,466,644, Cl. 292-263.000.
Worden, Raymond D.: *See*—
Geren, Lorenzo D., deceased; and Worden, Raymond D., 4,466,766, Cl. 414-404.000.
Wright, Raymond G. W., to Nabisco Brands, Inc. Article grading apparatus. 4,466,545, Cl. 209-684.000.
Wu, Chyuan-Jong. Electronic pace and distance counting shoe. 4,466,204, Cl. 36-132.000.
Wu, Jiun-tsong. Power generation. 4,466,244, Cl. 60-398.000.
Wueger, Karl W.: *See*—
Brouwer, Charles W.; Cowan, Larry C.; Horton, Robert; and Wueger, Karl W., 4,466,468, Cl. 139-435.000.
Brouwer, Charles W.; and Wueger, Karl W., 4,466,469, Cl. 139-435.000.
Wully S.A.: *See*—
Meschi, Luciano, 4,466,767, Cl. 414-411.000.
Xerox Corporation: *See*—
Chu, Joseph Y. C.; and Von Hoene, Donald C., 4,467,023, Cl. 430-66.000.
Folkins, Jeffrey J., 4,466,732, Cl. 355-14.00D.
Jansen, Frank; and Mort, Joseph, 4,466,380, Cl. 118-712.000.
Jugle, Don B., 4,466,730, Cl. 355-3.0DD.
Pels, Susan J., 4,466,733, Cl. 355-14.00R.
Rees, James D., 4,466,734, Cl. 355-58.000.
Yada, Hiroshi; Matsumura, Yoshikazu; and Nakajima, Koe, to Nippon Steel Corporation. Ferritic steel having ultra-fine grains and a method for producing the same. 4,466,842, Cl. 148-12.00R.
Yaeger, Michael J. Apparatus for playing game. 4,466,615, Cl. 273-292.000.
Yagi, Michio: *See*—
Watanabe, Koji; and Yagi, Michio, 4,467,248, Cl. 315-241.00P.
Yamada, Kenji: *See*—
Yoshimura, Junjiro; Yamada, Kenji; and Obata, Haruyuki, 4,466,414, Cl. 123-564.000.
Yamada, Shigeo: *See*—
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, 4,467,167, Cl. 219-69.00C.
Yamaguchi, Hiroaki: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,466,405, Cl. 123-416.000.
Yamaguchi, Tadashige: *See*—
Hasegawa, Shigezi; Yamaguchi, Tadashige; Hasegawa, Yatsuhiro; and Hasegawa, Shigekazu, 4,467,006, Cl. 428-137.000.
Yamamoto, Isao: *See*—
Tadokoro, Eiichi; Yamamoto, Isao; and Tanaka, Keiji, 4,466,164, Cl. 29-132.000.
Yamamoto, Kiyoshi: *See*—
Hiraoka, Takeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, 4,467,169, Cl. 219-121.0EB.
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, to Tonen Sekiyu Kagaku Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Weather resistant polyolefin composition. 4,467,061, Cl. 524-87.000.
Yamamoto, Shigeo: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,467,064, Cl. 524-114.000.
Yamamoto, Susumu: *See*—
Takeshita, Hiroshi; Chuwman, Tsutomu; and Yamamoto, Susumu, 4,466,673, Cl. 303-22.00R.
Yamamoto, Takeshi; Goto, Kiyoshi; Kurita, Yoshio; Kita, Noriyasu; and Kunieda, Naoshi, to Konishiroku Photo Industry Co., Ltd. Process of developing posi-type lithographic printing plate with inorganic alkali solution. 4,467,027, Cl. 430-302.000.
Yamanaka, Hiroomi: *See*—
Saito, Yasuji; and Yamanaka, Hiroomi, 4,466,475, Cl. 160-297.000.
Yamashita, Nobuo: *See*—
Ohno, Kunio; Nishioka, Kimihiko; Yamashita, Nobuo; Takahashi, Susumu; Namba, Akihiro; Mizusaki, Takashi; Akagi, Toshimasa; and Iino, Masaru, 4,467,361, Cl. 358-213.000.
Yamazaki, Etsuo: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,467,432, Cl. 364-474.000.
Yamazaki, Shigeo: *See*—
Yamamoto, Noboru; Shimada, Masakichi; Yamazaki, Shigeo; Kanai, Tsuyoshi; Sei, Kazuo; and Umemoto, Yoshiro, 4,467,061, Cl. 524-87.000.
Yamazaki, Yoshio: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Doi, Keiichiro; and Tanaka, Seiji, 4,467,162, Cl. 219-10.49R.
Yamin, Michael A.: *See*—
Cerami, Anthony; and Yamin, Michael A., 4,466,941, Cl. 422-57.000.
Yano, Hajime, to Sony Corporation. Optical device for controlling a light beam. 4,467,463, Cl. 369-45.000.
Yardngy Corporation: *See*—
Puglisi, Vincent J., 4,467,020, Cl. 429-101.000.
Yarnitsky, Yashaya; and Livny, Avinoam, to RCA Corporation. Jig for use in machining stylus blanks. 4,466,555, Cl. 221-224.000.
Yates, Carl E.: *See*—
Weikel, Scott J.; York, Theodore H., Jr.; and Yates, Carl E., 4,467,314, Cl. 340-310.00A.
Yodoshi, Hiroyuki: *See*—
Sakai, Hirohumi; Sukeda, Toshiaki; Yodoshi, Hiroyuki; and Imai, Satoru, 4,466,680, Cl. 339-45.00M.
Yokoi, Hiromasa: *See*—
Yoshimura, Tatsushiro; Nakazima, Takeaki; and Yokoi, Hiromasa, 4,466,832, Cl. 106-74.000.
Yokoi, Shinji; and Michida, Shinji. Bed unit. 4,466,147, Cl. 5-147.000.
Yokota, Hideo, to Canon Kabushiki Kaisha. Gauss type lens. 4,466,711, Cl. 350-464.000.
Yokoyama, Takeo; Imai, Ichiya; and Asaoka, Hideaki, to Showa Electric Wire & Cable Co., Ltd. Solid ultrasonic delay line. 4,467,295, Cl. 333-141.000.
Yoneda, Yukinori: *See*—
Kobayashi, Yosoji; Kato, Yoshitaka; Tokiwa, Kyoichi; Yoneda, Yukinori; Maie, Hiroyuki; Tamagami, Minoru; Motohashi, Shoji; Konishi, Tatsuo; and Araki, Shigeru, 4,467,371, Cl. 360-14.300.
Yoon, Do Y.: *See*—
Economy, James; Volksen, Willi; and Yoon, Do Y., 4,467,000, Cl. 427-385.500.
York, Theodore H., Jr.: *See*—
Weikel, Scott J.; York, Theodore H., Jr.; and Yates, Carl E., 4,467,314, Cl. 340-310.00A.
Yoshida Kogyo K.K.: *See*—
Hatagishi, Shingo, 4,466,168, Cl. 29-409.000.
Yoshida, Takao, to International Flavors & Fragrances Inc. Methyl substituted oxobicyclo-4,4,0-decane derivatives, process for preparing same and organoleptic uses thereof. 4,466,898, Cl. 252-174.110.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,467,464, Cl. 369-77.200.
Yoshii, Tsuneo; and Ueda, Toshitaka, to Ueda, Toshitaka. Catalyst. 4,467,049, Cl. 502-317.000.
Yoshikawa, Ryoichi: *See*—
Haraguchi, Shosuke; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Tosaka, Yoichi, 4,466,719, Cl. 354-173.110.
Yoshimura, Junjiro; Yamada, Kenji; and Obata, Haruyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Supercharged internal combustion engine. 4,466,414, Cl. 123-564.000.
Yoshimura, Tatsushiro; Nakazima, Takeaki; and Yokoi, Hiromasa, to Daikin Kogyo Company, Limited. Composition for forming hydrophilic coating. 4,466,832, Cl. 106-74.000.
Yoshino, Yasuhisa; Kodera, Masao; Ito, Hajime; and Ohta, Hisatoshi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Automotive rear safety checking apparatus. 4,467,313, Cl. 340-904.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Magami, Masato; Sato, Toshio; Katayama, Sakae; and Umekawa, Osamu, 4,466,975, Cl. 424-270.000.
Young, James R.: *See*—
Price, Elvin C.; Young, James R.; and Bottoms, Joseph A., 4,466,367, Cl. 112-134.000.
Young, John M.: *See*—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,466,981, Cl. 424-311.000.
Young, Rodney C.: *See*—
Brown, Thomas H.; and Young, Rodney C., 4,466,970, Cl. 424-263.000.
Yuasa, Kazunori, to Mitsubishi Denki Kabushiki Kaisha. Protective device for DC regulated power supplies for superconducting magnet coils. 4,467,384, Cl. 361-19.000.
Yuito, Isamu: *See*—
Futamoto, Masaaki; Yuito, Isamu; and Kawabe, Ushio, 4,467,240, Cl. 313-336.000.
Zagranski, Raymond D.: *See*—
Howlett, James J.; and Zagranski, Raymond D., 4,466,526, Cl. 192-0.096.
Zahnradfabrik Friedrichshafen, A.G.: *See*—
Liebert, Karl-Heinz; Fassbender, Rolf; and Tischer, Werner, 4,466,243, Cl. 60-384.000.
Zawodni, Frank W.: *See*—
Antonini, Joseph; and Zawodni, Frank W., 4,466,623, Cl. 277-153.000.
Zdinak, Paul: *See*—
St. Germain, Ronald E.; and Zdinak, Paul, 4,466,679, Cl. 339-44.00M.

Zeitel, Joachim, to Maschinenfabrik Alfred Schmermund GmbH & Co. Pattern for a box for cigarettes or cigarillos. 4,466,536, Cl. 206-273.000.

Zeitraeg, Rolf, to Siemens Aktiengesellschaft. Process for converting linear coded PCM words into non-linear coded PCM words and vice versa. 4,467,318, Cl. 340-347.0DD.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Preparation of trans cyclohexane 1,4-diurea. 4,467,114, Cl. 564-57.000.

Zenger, Richard D., to National Can Corporation. Composite container construction. 4,466,553, Cl. 220-461.000.

Zenith Electronics Corporation: *See*—
Citta, Richard W.; and Lee, Ronald B., 4,467,353, Cl. 358-120.000.

Zerlaut, Gene A.; Whitaker, Richard D.; and Purnell, Arthur W., to DSET Laboratories, Inc. Method and apparatus for determining spectral response and spectral response mismatch between photovoltaic devices. 4,467,438, Cl. 364-525.000.

Zerver, Alfred, to Hazet-Werk Hermann Zerver GmbH & Co. K.G. Mobile container. 4,466,628, Cl. 280-47.350.

Zeug, Josef. Method for melting metals. 4,466,827, Cl. 75-65.00R.

Zhed, Viktor P.: *See*—
Andreev, Anatoly A.; Gavrilov, Alexei G.; Galitskaya, Galina K.; Zhed, Viktor P.; Sinelschikov, Andrei K.; Padalka, Valentin G.; and Tolok, Vladimir T., 4,466,991, Cl. 427-38.000.

Zhuk, David S.; Keppen, Vera A.; Sivov, Nikolai A.; Tereschenko, Gennady F.; Golubkov, Igor M.; and Timofeev, Valery E., to Institut Neftekhimicheskogo Sinteza Imeni A.V. Toncheva Akademii Nauk SSSR. Method for preparing branched polyethylenimine. 4,467,115, Cl. 564-512.000.

Zimmer, John C. Security apparatus. 4,466,261, Cl. 70-229.000.

Zimmermann, Ingfried: *See*—
Hilmann, Juergen; Hoffmann, Rolf-Ruediger; Muetzel, Wolfgang; and Zimmermann, Ingfried, 4,466,442, Cl. 128-653.000.

Zinnen, Hermann A., to UOP Inc. Process for the separation of di-substituted benzene. 4,467,126, Cl. 568-937.000.

Zinser Textilmaschinen GmbH: *See*—
Lagemann, Bernd, 4,466,236, Cl. 57-80.000.

Zobele, Fulvio, to Zobele Industrie Chimiche S.p.A. Heating device for tablets containing evaporable substances at different temperatures. 4,467,177, Cl. 219-271.000.

Zobele Industrie Chimiche S.p.A.: *See*—
Zobele, Fulvio, 4,467,177, Cl. 219-271.000.

Zoecon Corporation: *See*—
Kohn, Gustave K.; and Bamberg, Joe T., 4,467,092, Cl. 546-291.000.

Zucco, Ernest, Jr. Motor translator. 4,467,254, Cl. 318-696.000.

Zuss, Sidney M. Toilet paper controlled dispenser. 4,466,563, Cl. 225-74.000.

Zwahlen, Hermann; and Remund, Ulrich, to Bystronic Maschinen AG. Method and device for distinguishing between field crops, particularly potatoes on one hand and stones or clods of soil on the other hand. 4,466,543, Cl. 209-556.000.

Zwyro A.G.: *See*—
Tesch, Bernhard, 4,466,238, Cl. 59-82.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF AUGUST, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alles, Harold G., to Bell Telephone Laboratories, Incorporated. Communication system using intelligent network processor. Re. 31,651, Cl. 370-66.000.

Bell Telephone Laboratories, Incorporated: *See*—
Alles, Harold G., Re. 31,651, Cl. 370-66.000.

Brodbeck, Robert M., to Marcamor, Inc. Combined telephone index and keyboard for dialer. Re. 31,649, Cl. 179-90.00B.

Chibana, Masanobu: *See*—
Kondo, Michio; Nakada, Akira; Chibana, Masanobu; Futamase, Tsuyoshi; and Ohya, Akiyoshi, Re. 31,648, Cl. 84-1.010.

Futamase, Tsuyoshi: *See*—
Kondo, Michio; Nakada, Akira; Chibana, Masanobu; Futamase, Tsuyoshi; and Ohya, Akiyoshi, Re. 31,648, Cl. 84-1.010.

Kondo, Michio; Nakada, Akira; Chibana, Masanobu; Futamase, Tsuyoshi; and Ohya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. System for generating tone source waveshapes. Re. 31,648, Cl. 84-1.010.

Marcamor, Inc.: *See*—
Brodbeck, Robert M., Re. 31,649, Cl. 179-90.00B.

Nakada, Akira: *See*—
Kondo, Michio; Nakada, Akira; Chibana, Masanobu; Futamase, Tsuyoshi; and Ohya, Akiyoshi, Re. 31,648, Cl. 84-1.010.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kondo, Michio; Nakada, Akira; Chibana, Masanobu; Futamase, Tsuyoshi; and Ohya, Akiyoshi, Re. 31,648, Cl. 84-1.010.

Ohya, Akiyoshi: *See*—
Kondo, Michio; Nakada, Akira; Chibana, Masanobu; Futamase, Tsuyoshi; and Ohya, Akiyoshi, Re. 31,648, Cl. 84-1.010.

Serritella, James J. Non-spillable cup lid. Re. 31,650, Cl. 229-7.00R.

LIST OF DESIGN PATENTEES

Airwick Industries, Inc.: *See*—
Hoyt, Earl, 275,222, Cl. D23-150.000.

Allen, Robert K.; Eicher, Charlotte A.; and Windslow, David, to American Greetings Corporation. Wheeled figure toy. 275,212, 8-21-84, Cl. D21-185.000.

Allis-Chalmers Corp.: *See*—
Schmidt, William M.; Demick, Robert; and Thorwaldsen, Stanley E., 275,199, Cl. D15-30.000.

Amco Corporation: *See*—
Bentson, Wade, 275,170, Cl. D7-409.000.

American Can Company: *See*—
Spencer, Kenneth B.; and Caner, Ali R., 275,179, Cl. D9-370.000.

American Commercial Incorporated: *See*—
Laslo, Larry R., 275,166, Cl. D7-137.000.
Laslo, Larry R., 275,167, Cl. D7-137.000.

American Greetings Corporation: *See*—
Allen, Robert K.; Eicher, Charlotte A.; and Windslow, David, 275,212, Cl. D21-185.000.

American Hospital Supply Corporation: *See*—
DeVroom, William A., 275,233, Cl. D24-53.000.

American Standard Inc.: *See*—
Enthoven, Axel, 275,221, Cl. D23-51.000.

Amprim, Ralph J., to General Motors Corporation. Air dam. 275,191, 8-21-84, Cl. D12-181.000.

Aronowitz, Robert; and Katzanek, Bernard. Chair. 275,158, 8-21-84, Cl. D6-366.000.

Bakus, Steven L., to Felt Products Mfg. Co. Display package. 275,180, 8-21-84, Cl. D9-415.000.

Ballone, Michael P.: *See*—
Levy, Edward D.; and Ballone, Michael P., 275,163, Cl. D6-553.000.

Bally Manufacturing Corporation: *See*—
Nutting, David, 275,208, Cl. D21-13.000.
Nutting, David, 275,209, Cl. D21-13.000.

Barber, Eddie N. Camera boom or the like. 275,202, 8-21-84, Cl. D16-44.000.

Bayerische Motoren Werke AG: *See*—
Gevert, Klaus V., 275,190, Cl. D12-158.000.

Benedict, Mellen-Thomas. Glass cutter. 275,171, 8-21-84, Cl. D8-51.000.

Bentson, Wade, to Amco Corporation. Roast spit. 275,170, 8-21-84, Cl. D7-409.000.

Bergmans, Charles, to Clarks of England, Inc. Shoe sole. 275,148, 8-21-84, Cl. D2-320.000.

Bernhardt, Floyd V. Golf putter head. 275,214, 8-21-84, Cl. D21-219.000.

Bernhardt, Floyd V. Golf putter head. 275,215, 8-21-84, Cl. D21-219.000.

Bernhardt, Floyd V. Golf putter head. 275,216, 8-21-84, Cl. D21-219.000.

Bernhardt, Floyd V. Golf putter head. 275,217, 8-21-84, Cl. D21-219.000.

Boston Machine & Tool Mfg. Co.: *See*—
Demirjian, Steven M.; and Demirjian, Laura M., 275,182, Cl. D10-16.000.

Brunson, Welton K.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 275,230, Cl. D24-34.000.

Buck, David G. Table or similar article. 275,164, 8-21-84, Cl. D6-449.000.

Buehrig, Gordon M., to Kughn, Richard P., a part interest. Automotive vehicle. 275,189, 8-21-84, Cl. D12-91.000.

Bunger, Richard E. Watering trough for animals. 275,238, 8-21-84, Cl. D30-13.000.

Caner, Ali R.: *See*—
Spencer, Kenneth B.; and Caner, Ali R., 275,179, Cl. D9-370.000.

Carlin, Milton O. Surgeon's chair. 275,155, 8-21-84, Cl. D6-353.000.

Carlin, Milton O. Surgeon's chair with backrest. 275,156, 8-21-84, Cl. D6-354.000.

Chan, Kai C.: *See*—
Lee, Man H.; Lee, Moon W.; Lin, Ping N.; and Chan, Kai C., 275,220, Cl. D22-19.000.

Chandler, Howard M.; Healey, Kevin; and Hurrell, John G. R., to Commonwealth Serum Laboratories Commission. Microbiological testing syringe. 275,234, 8-21-84, Cl. D24-55.000.

Chang, Wen-Hwang. Ice-skate. 275,218, 8-21-84, Cl. D21-225.000.

Charmbrik & Stone: *See*—
Darche, Joseph M., 275,224, Cl. D23-166.000.

Clarks Limited: *See*—
Radford, Alfred D., 275,144, Cl. D2-274.000.

Clarks of England, Inc.: *See*—
Bergmans, Charles, 275,148, Cl. D2-320.000.

Clover Mfg. Co., Ltd.: *See*—
Okada, Hidekazu, 275,151, Cl. D3-26.000.

Colight, Inc.: *See*—
Taylor, Claudia L.; and Lawson, Allen A., 275,201, Cl. D16-27.000.

Commonwealth Serum Laboratories Commission: *See*—
Chandler, Howard M.; Healey, Kevin; and Hurrell, John G. R., 275,234, Cl. D24-55.000.

Darche, Joseph M., to Charmbrik & Stone. Permanent briquette for gas fired barbeque grills. 275,224, 8-21-84, Cl. D23-166.000.

Dart Industries Inc.: *See*—
Grusin, Gerald M., 275,165, Cl. D7-1.000.

Demick, Robert: *See*—
Schmidt, William M.; Demick, Robert; and Thorwaldsen, Stanley E., 275,199, Cl. D15-30.000.

Demirjian, Laura M.: *See*—
Demirjian, Steven M.; and Demirjian, Laura M., 275,182, Cl. D10-16.000.

Demirjian, Steven M.; and Demirjian, Laura M., to Boston Machine & Tool Mfg. Co. Clock. 275,182, 8-21-84, Cl. D10-16.000.

DeVroom, William A., to American Hospital Supply Corporation. Manifold for a medical monitoring unit. 275,233, 8-21-84, Cl. D24-53.000.

Drackett Company, The: *See*—
Marxen, Marilyn, 275,223, Cl. D23-150.000.

Droppelman, Peter L.: *See*—
Jeffries, I. Thomas; and Droppelman, Peter L., 275,181, Cl. D9-438.000.

Eicher, Charlotte A.: *See*—
Allen, Robert K.; Eicher, Charlotte A.; and Windslow, David, 275,212, Cl. D21-185.000.

Electro-Nucleonics, Inc.: *See*—
Hegemann, Manfred, 275,225, Cl. D24-17.000.

Endt, Evert, to Telecommunications Radioelectriques & Telephoniques. Telephone. 275,195, 8-21-84, Cl. D14-53.000.

Enthoven, Axel, to American Standard Inc. Bidet. 275,221, 8-21-84, Cl. D23-51.000.
Epoch Company, Ltd.: *See—*
Matsumoto, Teruo, 275,210, Cl. D21-13.000.
Erco Mold Inc.: *See—*
Rolli, Ernest, 275,174, Cl. D8-356.000.
Rolli, Ernest P., Jr., 275,175, Cl. D8-356.000.
Feagle, Hugh B., to Hayes International Corporation. Portable antenna ground scoring unit for air to ground gunnery. 275,197, 8-21-84, Cl. D14-86.000.
Felt Products Mfg. Co.: *See—*
Bakus, Steven L., 275,180, Cl. D9-415.000.
Fineout, Gordon D. Drafting tool organizing device. 275,206, 8-21-84, Cl. D19-77.000.
Foster Grant Corporation: *See—*
Shelton, Robert N., 275,160, Cl. D6-483.000.
Shelton, Robert N., 275,161, Cl. D6-480.000.
Fuller, Ronald C. Compressible cleft palate nurser. 275,231, 8-21-84, Cl. D24-47.000.
Gard, Eric A., to Pennsylvania Scale Company. Scale base. 275,186, 8-21-84, Cl. D10-94.000.
Garner, James H., Jr. Arthroscopic surgical retractor. 275,227, 8-21-84, Cl. D24-27.000.
Gateway Scientific, Inc.: *See—*
Skarman, John S., 275,187, Cl. D10-106.000.
Gee Associates: *See—*
Levy, Edward D.; and Ballone, Michael P., 275,163, Cl. D6-553.000.
General Motors Corporation: *See—*
Amprim, Ralph J., 275,191, Cl. D12-181.000.
Schinella, John R., 275,192, Cl. D12-211.000.
Schinella, John R., 275,193, Cl. D12-211.000.
Gerch, Edward L., to Kingport, Ltd. Front panel for a portfolio. 275,152, 8-21-84, Cl. D3-71.000.
Gevert, Klaus V., to Bayerische Motoren Werke AG. Luggage case for motorcycle. 275,190, 8-21-84, Cl. D12-158.000.
Gillis, Joseph P., to Kidde, Inc. Combined battery operated explosion detection and suppression unit for industrial storage enclosures. 275,237, 8-21-84, Cl. D29-2.000.
Glatz, Ernst, to Scholl, Inc. Sandal. 275,145, 8-21-84, Cl. D2-283.000.
Goshi Kaisha Kanemitsu Doko Yosetsu-Sho: *See—*
Kanemitsu, Yukio, 275,176, Cl. D8-360.000.
Grusin, Gerald M., to Dart Industries Inc. Food storage container or similar article. 275,165, 8-21-84, Cl. D7-1.000.
Haws, Jesse V. Holder for a needle craft kit. 275,150, 8-21-84, Cl. D3-23.000.
Hayes International Corporation: *See—*
Feagle, Hugh B., 275,197, Cl. D14-86.000.
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18 BC 4,467,143
84 R 4,467,144
90 B Re.31,649
107 R 4,467,145
170.2 4,467,146
175.2 C 4,467,147
175.23 4,467,149
175.3 R 4,467,148

CLASS 180

247 4,466,502
259 4,466,503
273 4,466,504

CLASS 181

144 4,466,505

CLASS 182

2 4,466,506
3 4,466,507

CLASS 184

13.1 4,466,508

CLASS 187

18 4,466,509
29 R 4,466,510

CLASS 188

134 4,466,511
171 4,466,512
243 4,466,513
320 4,466,514

CLASS 190

2 4,466,516
8 4,466,517

CLASS 192

0.032 4,466,521
0.076 4,466,525
0.096 4,466,526
3.29 4,466,518
13 R 4,466,519
28 4,466,520
36 4,466,522
43.1 4,466,523
98 4,466,527

CLASS 194

1 N 4,466,528

CLASS 198

368 4,466,529
472 4,466,530
486 4,466,531
490 4,466,532
676 4,466,533

CLASS 200

5 A 4,467,150
4,467,151
42 T 4,467,152
61.45 R 4,467,153
4,467,154
81 R 4,467,155
84 R 4,467,156
148 A 4,467,158
148 F 4,467,157
153 J 4,467,159
159 A 4,467,160
281 4,467,161

CLASS 202

99 4,466,863

CLASS 204

15 4,466,864
51 4,466,865
59 F 4,466,881
78 4,466,866
91 4,466,867
95 4,466,868
157.1 R 4,466,869
158 S 4,466,870
181 N 4,466,871
192 EC 4,466,874
192 R 4,466,872
4,466,875
298 4,466,876
4,466,877
415 4,466,878
4,466,879
428 4,466,880

CLASS 206

45.34 4,466,534
83.5 4,466,535
273 4,466,536
317 4,466,537
366 4,466,538
370 4,466,539
387 4,466,540
506 4,466,541

CLASS 208

11 R 4,466,882
50 4,466,883
120 4,466,884
188 4,466,885

CLASS 209

44.2 4,466,542
166 4,466,886
4,466,887
556 4,466,543
580 4,466,544
684 4,466,545

CLASS 210

232 4,466,888

CLASS 213

148 4,466,546

CLASS 215

11 E 4,466,547
307 4,466,548

CLASS 219

10.49 R 4,467,162
10.55 F 4,467,163
10.55 M 4,467,164
10.77 4,467,165
69 C 4,467,167
69 W 4,467,166
121 EB 4,467,169
121 EH 4,467,170
121 LG 4,467,168
4,467,171
121 LH 4,467,172
125.12 4,467,173
132 4,467,174
137.31 4,467,175
137.71 4,467,176
271 4,467,177
330 4,467,178
368 4,467,179
449 4,467,180
451 4,467,181
497 4,467,182
4,467,183
506 4,467,184
539 4,467,185

CLASS 220

4 A 4,466,549
206 4,466,550
293 4,466,551
354 4,466,552
461 4,466,553

CLASS 221

1 4,466,554
224 4,466,555

CLASS 222

1 4,466,556
144 4,466,557
195 4,466,558
196 4,466,559
4,466,560

CLASS 224

163 4,466,561

CLASS 225

2 4,466,562
74 4,466,563

CLASS 226

170 4,466,564

CLASS 228

1 B 4,466,565
155 4,466,566
183 4,466,567

CLASS 229

7 R Re.31,650

CLASS 235

487 4,467,209

CLASS 237

12.3 C 4,466,568

CLASS 238

1 4,466,569
153 4,466,570

CLASS 239

101 4,466,571
186 4,466,572
265.41 4,466,573
455 4,466,574

CLASS 242

18 PW 4,466,575
47.01 4,466,576
58 4,466,577
65 4,466,578
67.1 R 4,466,579
84.21 R 4,466,580
96 4,466,581
197 4,466,582
198 4,466,583
199 4,466,584
4,466,585

CLASS 244

75 R 4,466,586
121 4,466,587

CLASS 246

122 A 4,466,588

CLASS 248

61 4,466,589
185 4,466,590
217.1 4,466,591
225.1 4,466,592
455 4,466,593
484 4,466,594
558 4,466,595
635 4,466,596

CLASS 250

201 4,467,186
204 4,467,187
4,467,188
213 VT 4,467,189
4,467,190
214 A 4,467,191
4,467,192
216 4,467,193
4,467,194
4,467,195
227 4,467,196
305 4,467,197
308 4,467,198
310 4,467,199
324 4,467,200
334 4,467,201
338 4,467,202
343 4,467,203
4,467,204
397 4,467,205
435 4,467,206
459.1 4,467,207
483.1 4,467,208
492.2 4,467,210
4,467,211
497.1 4,467,212
504 R 4,467,213
563 4,467,214
571 4,467,215

CLASS 251

130 4,466,597

CLASS 252

8.55 C 4,466,893
8.55 D 4,466,889
4,466,891
4,466,892
8.55 R 4,466,890
32.7 E 4,466,894
4,466,895
4,466,901
49.5 4,466,909
78.3 4,466,896
108 4,466,897
174.11 4,466,898
299.1 4,466,899
301.23 4,466,900
391 4,466,902
392 4,466,903
402 4,466,904
403 4,466,905
500 4,466,910
4,466,911
512 4,466,912
522 R 4,466,908

CLASS 254

358 4,466,598
391 4,466,599

CLASS 256

65 4,466,600

CLASS 260

112 R 4,466,917
112.5 R 4,466,913
4,466,918
4,466,919
187 4,466,920
239 A 4,466,914
239.3 R 4,466,915
4,466,916
397.3 4,466,921
410.9 R 4,466,922
412.4 4,466,923
429 R 4,466,924
439 R 4,466,925
458 F 4,466,926
544 C 4,466,927

CLASS 261

76 4,466,928

CLASS 264

1.2 4,466,929
4,466,930
22 4,466,931
29.3 4,466,932
54 4,466,933
106 4,466,934
184 4,466,935
225 4,466,936
256 4,466,937
352 4,466,938

CLASS 269

79 4,466,601

CLASS 270

31 4,466,602
58 4,466,603

CLASS 271

111 4,466,604
177 4,466,605
221 4,466,606
225 4,466,607
293 4,466,608
4,466,609

CLASS 272

93 4,466,610
96 4,466,611
133 4,466,612
142 4,466,613

CLASS 273

139 4,466,614
256 4,466,515
292 4,466,615
384 4,466,616

CLASS 277

4 4,466,617
12 4,466,618
15 4,466,619
53 4,466,620
84 4,466,621
92 4,466,622
153 4,466,623
171 4,466,624

CLASS 280

6 R 4,466,625
12.14 4,466,626
21 A 4,466,627
47.35 4,466,628
279 4,466,629
289 D 4,466,630
415 A 4,466,631
478 R 4,466,632
492 4,466,633
632 4,466,634
661 4,466,635
724 4,466,636
766.1 4,466,637

CLASS 281

33 4,466,638
45 4,466,639

CLASS 285

104 4,466,640
406 4,466,641
419 4,466,642

CLASS 290

43 4,467,216
54 4,467,217
4,467,218

CLASS 292

92 4,466,643
263 4,466,644
341.12 4,466,645

CLASS 293

117 4,466,646

CLASS 294

1 BA 4,466,648
1 BB 4,466,647
19 A 4,466,650
19 R 4,466,649
82 R 4,466,651
142 4,466,652

CLASS 296

189 4,466,653
192 4,466,654
214 4,466,655
216 4,466,656
221 4,466,657
223 4,466,658

CLASS 297

191 4,466,659
195 4,466,660
367 4,466,661
406 4,466,662
410 4,466,663
411 4,466,664
418 4,466,665
483 4,466,666

CLASS 299

1 4,466,667
2 4,466,668
7 4,466,669

CLASS 301

11 CD 4,466,670

CLASS 303

6 C 4,466,671
22 R 4,466,672
4,466,673

CLASS 307

10 R 4,467,219
19 4,467,220
112 4,467,221
115 4,467,222
254 4,467,223
270 4,467,224
296 A 4,467,225
315 4,467,226
577 4,467,227

CLASS 310

60 A 4,467,229
83 4,467,230
154 4,467,231
4,467,232
162 4,467,233
195 4,467,234
313 D 4,467,235
321 4,467,236
334 4,467,237

CLASS 312

250 4,466,674
263 4,466,675
283 4,466,676

CLASS 313

25 4,467,238
113 4,467,239
336 4,467,240
402 4,467,241
406 4,467,242
448 4,467,243

CLASS 315

3 4,467,244
75 4,467,245
158 4,467,246
189 4,467,247
241 P 4,467,248

CLASS 318

282 4,467,249
436 4,467,250
480 4,467,251
603 4,467,252
636 4,467,253
696 4,467,254
4,467,255
4,467,256
774 4,467,257
800 4,467,258
4,467,259
4,467,260
810 4,467,261
811 4,467,262

CLASS 320

2 4,467,263
4,467,264
17 4,467,265
40 4,467,266

CLASS 322

61 4,467,267

CLASS 323

222 4,467,268
356 4,467,269

CLASS 324

51 4,467,270
56 4,467,271
59 4,467,272
65 R 4,467,273
71.1 4,467,274
73 AT 4,467,275
77 R 4,467,276
78 R 4,467,277
95 4,467,278
158 MG 4,467,279
206 4,467,280
232 4,467,281
309 4,467,282
363 4,467,283

CLASS 328

61 4,467,284
112 4,467,285

CLASS 330

86 4,467,286
126 4,467,287
149 4,467,288
288 4,467,289
290 4,467,290

CLASS 332

11 D 4,467,291

CLASS 333

24.1 4,467,292
112 4,467,293
126 4,467,294
141 4,467,295
202 4,467,296

CLASS 335

8 4,467,297
16 4,467,298
20 4,467,299
131 4,467,300
195 4,467,301
212 4,467,302
216 4,467,303
227 4,467,304

CLASS 336

55 4,467,305
58 4,467,306

CLASS 337

30 4,467,307
231 4,467,308

CLASS 338

22 R 4,467,309
4,467,310
293 4,467,311
309 4,467,312

CLASS 339

15 4,466,677
17 CF 4,466,678
44 M 4,466,679
45 M 4,466,680
97 R 4,466,681
4,466,682
125 R 4,466,683
176 M 4,466,684
177 R 4,466,685
196 M 4,466,686
198 H 4,466,687
252 R 4,466,688
263 R 4,466,689
272 A 4,466,690
272 R 4,466,691
276 SF 4,466,692

CLASS 340

310 A 4,467,314
347 DA 4,467,316
4,467,319
347 DD 4,467,315
4,467,317
4,467,318
347 SY 4,467,320
365 VL 4,467,321
701 4,467,322
721 4,467,323
722 4,467,324
794 4,467,325
904 4,467,313

CLASS 343

6.5 R 4,467,326
17.7 4,467,327
18 E 4,467,328
753 4,467,329
872 4,467,330

CLASS 346

22 4,467,331
140 R 4,467,332
154 4,467,333
160 4,467,334
4,467,335
200 4,467,336
209 4,467,337
4,467,338
214 4,467,339

CLASS 350

3.6 4,466,693
96.19 4,466,694
96.20 4,466,695
4,466,696
96.30 4,466,697
99 4,466,698
166 4,466,699
310 4,466,700
336 4,466,701
347 R 4,466,702
379 4,466,703
398 4,466,704
418 4,466,705
419 4,466,706
422 4,466,707
427 4,466,708
429 4,466,709
464 4,466,710
4,466,711
582 4,466,712

CLASS 351

106 4,466,713

CLASS 352

129 4,466,714

CLASS 353

45 4,466,715
94 4,466,716
122 4,466,717

CLASS 354

173.11 4,466,719
244 4,466,720
267.1 4,466,721
299 4,466,722
400 4,466,723
402 4,466,724
403 4,466,725
408 4,466,718
409 4,466,726
417 4,466,727

CLASS 355

3 CH 4,466,729
3 DD 4,466,728
4,466,730
14 D 4,466,731
4,466,732
14 R 4,466,733
58 4,466,734
71 4,466,735
75 4,466,736
84 4,466,737

CLASS 356

4.5 4,466,738
138 4,466,739
246 4,466,740

CLASS 357

24 4,467,340
4,467,341
30 4,467,342
38 4,467,343
39 4,467,344
68 4,467,345

CLASS 358

12 4,467,346
44 4,467,347
78 4,467,348
93 4,467,349
106 4,467,350
111 4,467,351
4,467,352
120 4,467,353
133 4,467,354
134 4,467,355
146 4,467,356
148 4,467,357
153 4,467,358
159 4,467,359
197 4,467,360
213 4,467,361
227 4,467,362
261 4,467,363
280 4,467,364
293 4,467,365
296 4,467,366
298 4,467,367
310 4,467,368
332 4,467,369

CLASS 360

13 4,467,370
14.3 4,467,371
31 4,467,372
38.1 4,467,373
46 4,467,374
72.1 4,467,375
84 4,467,376
96.1 4,467,377
96.5 4,467,378
4,467,379
4,467,380
106 4,467,381
125 4,467,382
131 4,467,383

CLASS 361

19 4,467,384
24 4,467,385
56 4,467,390
106 4,467,386
132 4,467,387
145 4,467,388
151 4,467,389
179 4,467,391
275 4,467,392
278 4,467,393
283 4,467,394
315 4,467,395
321 4,467,396
328 4,467,397
331 4,467,398
379 4,467,399
403 4,467,400
427 4,467,401

CLASS 362

32 4,467,402
250 4,467,403
346 4,467,404
352 4,467,405

CLASS 363

19 4,467,406
43 4,467,407
54 4,467,408

CLASS 364

200 4,467,409
4,467,410
4,467,411
4,467,412
4,467,413
4,467,414
4,467,415
4,467,416
4,467,417
4,467,418
4,467,419
4,467,420
4,467,421
4,467,422
400 4,467,423
412 4,467,424
422 4,467,425
424 4,467,426
424.1 4,467,427
426 4,467,428
433 4,467,429
436 4,467,430
473 4,467,431
474 4,467,432
481 4,467,433
483 4,467,434
497 4,467,435
513 4,467,436
513.5 4,467,437
525 4,467,438
716 4,467,439
724 4,467,440
4,467,441
843 4,467,442
900 4,467,443
4,467,444
4,467,445
4,467,446
4,467,447
4,467,448

CLASS 365

51 4,467,449
149 4,467,450
156 4,467,451
184 4,467,452
185 4,467,453
189 4,467,454
4,467,455
190 4,467,456
228 4,467,457
230 4,467,458

CLASS 366

339 4,466,741

CLASS 367

21 4,467,459
56 4,467,460
70 4,467,461

CLASS 368

10 4,466,742
63 4,466,743
262 4,466,744
281 4,466,745

CLASS 369

45 4,467,462
4,467,463
77.2 4,467,464
4,467,465
4,467,466
111 4,467,467

CLASS 370

3 4,467,468
58 4,467,469
66 Re.31,651
4,467,470
68 4,467,471
97 4,467,472
100 4,467,473

CLASS 372

89 4,467,474

CLASS 374

5 4,466,746
101 4,466,747
129 4,466,748
134 4,466,749

CLASS 384

117 4,466,750
126 4,466,751
192 4,466,752

CLASS 400

354 4,466,753

CLASS 403

11 4,466,754
36 4,466,755
311 4,466,756

CLASS 404

114 4,466,757

CLASS 405

150 4,466,758

CLASS 406

15 4,466,759
41 4,466,760
74 4,466,761

CLASS 408

222 4,466,762

CLASS 411

521 4,466,763

CLASS 414

121 4,466,764
277 4,466,765
404 4,466,766
411 4,466,767
729 4,466,768
744 R 4,466,769
751 4,466,770
787 4,466,771

CLASS 415

172 A 4,466,772

CLASS 416

134 A 4,466,773
4,466,774
143 4,466,775
221 4,466,776

CLASS 417

12 4,466,777
174 4,466,778
229 4,466,779
360 4,466,780
366 4,466,781
517 4,466,782

CLASS 418

15 4,466,783
55 4,466,784
152 4,466,785

CLASS 420

485 4,466,939
507 4,466,940

CLASS 422

57 4,466,941
61 4,466,942
91 4,466,943
113 4,466,995

CLASS 423

6 4,466,944
53 4,466,945
228 4,466,946
239 4,466,947
321 R 4,466,948
447.4 4,466,949
599 4,466,950

CLASS 424

1.1 4,466,951
4,466,952
28 4,466,953
50 4,466,954
62 4,466,955
80 4,466,956
89 4,466,957
127 4,466,958
150 4,466,959
166 4,466,960
180 4,466,961
200 4,466,962
244 4,466,963
246 4,466,964
250 4,466,965
251 4,466,966
258 4,466,967
260 4,466,968
263 4,466,969
4,466,970
266 4,466,971
4,466,972
267 4,466,973
269 4,466,974
270 4,466,975
273 R 4,466,976
274 4,466,977
280 4,466,978
285 4,466,979
305 4,466,980
311 4,466,981

CLASS 425

7 4,466,786
122 4,466,787

CLASS 426

1 4,466,982
5 4,466,983
105 4,466,984
131 4,466,985
533 4,466,986
632 4,466,987
656 4,466,988

CLASS 427

35 4,466,990
38 4,466,991
39 4,466,992
44 4,466,993
56.1 4,466,994
122 4,466,996
140 4,466,997
185 4,466,989
297 4,466,998
329 4,466,999
385.5 4,467,000
434.6 4,467,001

CLASS 428

36 4,467,002
64 4,467,003
81 4,467,004
111 4,467,005
137 4,467,006
142 4,467,007
156 4,467,008
210 4,467,009
212 4,467,010
245 4,467,011
248 4,467,012
289 4,467,013
314.4 4,467,014
454 4,467,015
595 4,467,016

CLASS 429

9 4,467,017
18 4,467,018
34 4,467,019
101 4,467,020
175 4,467,021

CLASS 430

17 4,467,022
66 4,467,023
166 4,467,024
191 4,467,025
296 4,467,026
302 4,467,027
4,467,028
441 4,467,029

CLASS 431

255 4,466,788
264 4,466,789
337 4,466,790

CLASS 432

23 4,466,791
122 4,466,792
253 4,466,793

CLASS 433

69 4,466,794
166 4,466,795
173 4,466,796

CLASS 434

61 4,466,797
118 4,466,798
203 4,466,799
267 4,466,800
335 4,466,801

CLASS 435

7 4,467,030
4,467,031
34 4,467,032
105 4,467,033
139 4,467,034
253 4,467,035
317 4,467,036

CLASS 436

89 4,467,037
115 4,467,038

CLASS 446

46 4,466,212
56 4,466,213
437 4,466,214
469 4,466,215

CLASS 474

138 4,466,802
4,466,803

CLASS 501

3 4,467,039
80 4,467,040
4,467,041
88 4,467,042
4,467,043

CLASS 502

11 4,466,906
35 4,467,045
74 4,466,907
111 4,467,044
174 4,467,046
246 4,467,047
4,467,048
317 4,467,049
330 4,467,050

CLASS 521

77 4,467,051
92 4,467,052
128 4,467,053
188 4,467,054

CLASS 523

200 4,467,055
208 4,467,056
212 4,467,057
353 4,467,060

CLASS 524

87 4,467,061
89 4,467,062
106 4,467,063
114 4,467,064
296 4,467,065
371 4,467,066
435 4,467,067
449 4,467,077
731 4,467,068

CLASS 525

110 4,467,070
112 4,467,071
117 4,467,072
127 4,467,073
356 4,467,074
4,467,075
391 4,467,076
455 4,467,078

CLASS 526

62 4,467,080
90 4,467,079

CLASS 528

26 4,467,081
43 4,467,082
49 4,467,083
324 4,467,084

CLASS 536

43 4,467,085

CLASS 544

25 4,467,086
182 4,467,087
197 4,467,088
351 4,467,089

CLASS 546

85 4,467,090
285 4,467,091
291 4,467,092
321 4,467,093
334 4,467,094
342 4,467,095

CLASS 548

247 4,467,096
263 4,467,098
264 4,467,099
429 4,467,100
461 4,467,097

CLASS 549

76 4,467,101
78 4,467,102
361 4,467,103
462 4,467,104

CLASS 556

444 4,467,105

CLASS 560

72 4,467,106
170 4,467,107
180 4,467,108
193 4,467,109

CLASS 562

487 4,467,110
4,467,111
493 4,467,112
535 4,467,113

CLASS 564

57 4,467,114
512 4,467,115

CLASS 568

454 4,467,116
484 4,467,120
637 4,467,117
687 4,467,118
724 4,467,119
726 4,467,121
727 4,467,122
730 4,467,123
842 4,467,124
936 4,467,125
937 4,467,126

CLASS 570

224 4,467,127

CLASS 585

456 4,467,128
481 4,467,129
709 4,467,130
723 4,467,131
724 4,467,132
733 4,467,133

CLASS 604

4 4,466,804

CLASSIFICATION OF DESIGNS

D2—	274	275,144		449	275,164		360	275,176		211	275,192	D21—	13	275,208		166	275,224
	283	275,145		480	275,161		373	275,177			275,193			275,209	D24—	17	275,225
	320	275,146		483	275,157		380	275,178	D13—	12	275,194			275,210			275,226
		275,147			275,160	D9—	370	275,179	D14—	53	275,195		116	275,211		27	275,227
		275,148		553	275,163		415	275,180		54	275,196		185	275,212		29	275,228
	361	275,149	D7—	1	275,165		438	275,181		86	275,197		191	275,213		31	275,229
D3—	23	275,150		137	275,166	D10—	16	275,182	D15—	1	275,198		219	275,214		34	275,230
	26	275,151			275,167		46	275,183		30	275,199			275,215		47	275,231
	71	275,152		151	275,168		75	275,184		66	275,200			275,216		51	275,232
	77	275,153			275,169		81	275,185	D16—	27	275,201			275,217		53	275,233
D6—	317	275,162		409	275,170		94	275,186		44	275,202		225	275,218		55	275,234
	353	275,155	D8—	51	275,171		106	275,187		113	275,203		234	275,219	D25—	62	275,235
	354	275,156		323	275,172		115	275,188		117	275,204	D22—	19	275,220	D28—	63	275,236
	366	275,158		353	275,173	D12—	91	275,189		133	275,205	D23—	51	275,221	D29—	2	275,237
	384	275,159		356	275,174		158	275,190	D19—	77	275,206		150	275,222	D30—	13	275,238
	431	275,154			275,175		181	275,191	D20—	42	275,207			275,223			

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